

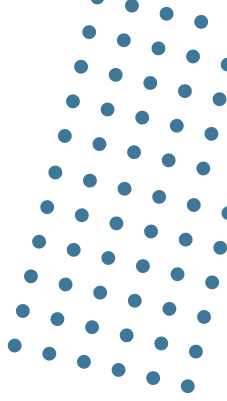


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# Digital Kids Asia-Pacific

## Insights into Children's Digital Citizenship





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# Table of Contents

Foreword .....	vii
Acknowledgements .....	ix
Acronyms .....	xi
Executive Summary .....	xiii
<b>1. Introduction .....</b>	<b>1</b>
The Asia-Pacific context.....	3
Digital citizenship and the Education 2030 Agenda.....	3
Project background.....	4
Objectives of the study .....	6
Research questions .....	6
<b>2. UNESCO Digital Kids Asia-Pacific (DKAP) Framework for Education .....</b>	<b>7</b>
<b>3. Methodology .....</b>	<b>11</b>
Target age group .....	12
Survey item development.....	12
Sampling .....	14
Data collection .....	16
Ethical considerations.....	18
Survey validation: Reliability and Validity .....	18
<b>4. Findings .....</b>	<b>20</b>
What is the overall performance of students across four countries? .....	20
What factors affect students' digital citizenship competencies? .....	22
Which devices do they mostly have access to? .....	22
For how long have students used digital devices? .....	25

For how many hours a day do children use digital devices? .....	26
Does gender matter? .....	27
Does geographical location matter? .....	28
From whom do children learn about computers and the Internet? .....	28
Do teachers encourage students to explore or learn things using the Internet? .....	30
Do parents encourage students to explore or learn things on the Internet? .....	31
Do siblings encourage students to explore or learn things on the Internet? .....	31
Do peers encourage students to explore or learn things on the Internet? .....	31
How do parents' education levels affect students' digital citizenship competencies? .....	31
What are the domain-specific findings and factors that affect them? .....	32
Digital Literacy .....	32
Digital Safety and Resilience .....	34
How do students react when they face risks? Whom do they ask for help? .....	35
How do students react to negative experiences online? .....	37
Digital Participation and Agency .....	42
Digital Emotional Intelligence .....	44
Digital Creativity and Innovation .....	46
<b>5. Limitation and challenges.....</b>	<b>48</b>
Limitation in research methodologies .....	48
Challenges .....	49
<b>6. Policy recommendations.....</b>	<b>50</b>
Develop a holistic concept of digital citizenship that goes beyond digital skills and safety.....	50
Encourage research on children that reflects their voices in policy development .....	51
Build student support systems with parents, teachers, peers, and siblings.....	52
Embrace positive sides of screen time, but with caution .....	52
Make a coordinated effort to close the digital divides .....	53
Empower girls and focus on their talents .....	54
Develop inter-sectoral partnerships to address identified challenges .....	54
<b>7. Conclusion .....</b>	<b>56</b>
<b>References.....</b>	<b>58</b>
<b>Glossary .....</b>	<b>68</b>

<b>Annex 1:</b>	Table of Frameworks .....	70
<b>Annex 2:</b>	Survey Questionnaire (as of 22 April 2019) .....	81
<b>Annex 3:</b>	Survey Translation Process, Training Manual, and Checklist .....	103
<b>Annex 4:</b>	Results of Internal Consistency, Mean Correlation and Confirmatory Factor Analysis .....	114
<b>Annex 5:</b>	Country Mean Scores.....	124
<b>Annex 6:</b>	Results of Multiple Regression Analysis.....	129
<b>Annex 7:</b>	Tables of Gender Differences by Domain.....	135
<b>Annex 8:</b>	Tables of Urban-Rural School Location Differences by Domain .....	145
<b>Annex 9:</b>	Challenges Identified by Pilot Countries.....	148
<b>Annex 10:</b>	SDG 4 Targets .....	151

## List of Figures

<b>Figure 1:</b>	Data collection and analysis procedure.....	11
<b>Figure 2:</b>	Survey item development procedure.....	13
<b>Figure 3:</b>	Data collection and field operation procedures.....	16
<b>Figure 4:</b>	Survey translation process .....	17
<b>Figure 5:</b>	Overall mean score of each domain by country.....	21
<b>Figure 6:</b>	Overall trend of each domain.....	22
<b>Figure 7:</b>	Number of years of experience using digital devices (e.g., desktop/laptop, smartphone, tablet PC).....	25
<b>Figure 8:</b>	Length of time spent on the Internet using digital devices (e.g., smartphone, desktop/laptop, tablet PC) per day. ....	26
<b>Figure 9:</b>	Percentage of students who were taught how to use computers, by country and source of learning. ....	29
<b>Figure 10:</b>	Percentage of students who were taught about how to use the Internet, by country and source of learning. ....	29
<b>Figure 11:</b>	Cross-national comparison of Digital Literacy.....	32
<b>Figure 12:</b>	Cross-national comparison of Digital Safety and Resilience. ....	34
<b>Figure 13:</b>	Cross-national comparison of Digital Participation and Agency.....	42
<b>Figure 14:</b>	Cross-national comparison of Digital Emotional Intelligence.....	44
<b>Figure 15:</b>	Cross-national comparison of Digital Creativity and Innovation.....	46

## List of Tables

<b>Table 1:</b>	Statistical data of the participating Member States in the DKAP research .....	5
<b>Table 2:</b>	UNESCO Digital Kids Asia-Pacific Framework for Education .....	9
<b>Table 3:</b>	Summary of survey questions by category and number.....	13
<b>Table 4:</b>	Summary of the survey respondents by country characteristics and by gender....	15
<b>Table 5:</b>	Survey languages by country.....	17
<b>Table 6:</b>	Survey time allocation. ....	17
<b>Table 7:</b>	Percentage of students with access to digital devices at home, by country and type of device. ....	22
<b>Table 8:</b>	Percentage of students with access to digital devices at school, by country and type of device. ....	23
<b>Table 9:</b>	Percentage of students with access to digital devices in the local community, by country and type of device. ....	24
<b>Table 10:</b>	Correlation between gender and digital citizenship competencies by country. ....	27
<b>Table 11:</b>	Frequency at which students are encouraged to explore or learn things on the Internet, by country and type of stakeholder.....	30
<b>Table 12:</b>	Frequency at which students are guided to use the Internet safely, by country and type of stakeholder.....	36
<b>Table 13:</b>	Answers to question B15: "How will you react when you are exposed to unwanted disturbing file or website (e.g., pornography website, violent media)?" .....	37
<b>Table 14:</b>	Answers to question B16: "How will you react when you receive unwanted disturbing messages including annoying messages or embarrassing pictures from someone on your contact list?" .....	38
<b>Table 15:</b>	Answers to question B17: "How will you react when you find that your personal information is misused, compromised or acquired without permission online?" ...	39
<b>Table 16:</b>	Answers to question B18: "How will you react when you are bullied online by friends or others?" .....	40

# Foreword

For many of us, information and communication technologies (ICT) have permeated all aspects of our lives from the moment we wake up to the moment we fall asleep. Many children today have never known a world without digital technologies and the Internet. Children whose lives are mediated by technology have a powerful means to access a constant stream of information, engage in instant interactions and communicate with people from the other side of the globe. This potential to access, engage and learn online through networks with others comes with concomitant risks such as cyberbullying, misinformation, child online sexual exploitation, grooming, extremism and others.

As a result of these developments, governments in the Asia-Pacific region have recognized the need for educational interventions to adapt to the rapidly changing technological environment. At the same time, there is a lack of information on what children know about technology, how they use and perceive it, and how they cope with digital risks at home and at school. This has limited the guidance available to policy-makers and education stakeholders on evidence-based actions to adapt or rethink their education systems to address these issues of children's online risk and safety, while maximizing the potential of technology for learning, employment and inclusiveness. In fact, this report suggests that children's relatively higher competencies in safety and resilience come at the cost of lower digital citizenship competencies related to creativity, emotional intelligence or civic participation.

UNESCO's Digital Kids Asia-Pacific (DKAP) is a groundbreaking project that has addressed this dearth of reliable data through the development of a Framework for Education and accompanying statistically validated survey. The DKAP Framework for Education and survey combine to form an evidence-based foundation on children's knowledge, behaviour, and attitudes toward ICT. It informs comprehensive education policy development as well as interventions such as curriculum design, public awareness activities, education campaigns and education resources. Through these findings and promoting the use of DKAP resources for further modification or adaptation, UNESCO seeks to drive the discourse and actions on children, education and technology in a child-centred and holistic way as children's development becomes increasingly mediated by networked digital technologies.

DKAP builds upon the recognition by every government that ICT is one of the key enablers to achieve Sustainable Development Goal (SDG) 4 on inclusive and equitable quality lifelong learning for all. The DKAP Framework for Education highlights an urgent need to go beyond the basic requirements of ICT skills and addresses the concept of digital skills broadly, including digital participation, digital emotional intelligence and digital creativity. Indeed, well-



grounded digital skills are a critical component of relevant skills for employment, decent work and entrepreneurship under SDG 4. DKAP also reinforces the importance of key concepts of SDG 4 such as global citizenship education, transversal competencies and socio-emotional competencies. These digital citizenship competencies will be critical for children who are growing up in a world beset by a range of issues including climate change, automation, artificial intelligence, widening inequality and violent extremism.

It is hoped that these initial steps taken by DKAP will lead to a world where children have equal and quality access to ICT, are safer and more resilient, empowered to create and lead change, and free to exercise their rights to express themselves within the digital environment and outside of it.



Shigeru Aoyagi  
*Director*  
*UNESCO Bangkok*

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# Acronyms

CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CIL	Computer Information Literacy
DKAP	Digital Kids Asia-Pacific
DOET	Provincial Department of Education and Training
DSHE	Directorate of Secondary and Higher Education
EMIS	Educational Management Information System
ERI-NET	Education Research Institutes and Network
EU	European Union
GCED	Global Citizenship Education
ICILS	International Computer and Information Literacy Study
ICT	Information and Communications Technology
IDI	ICT Development Index
IEA	International Association for the Evaluation of Educational Achievement
ISTE	International Society for Technology in Education
ISVP	Institute of School Violence Prevention
IT	Information technology
ITU	International Telecommunication Union
MDG	Millennium Development Goal
MIL	Media and Information Literacy
MOE	Ministry of Education
MOEHA	Ministry of Education, Heritage and Arts
MOET	Ministry of Education and Training
NGO	Non-Governmental Organization
NRT	National Research Team

OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Study Assessment
RMSEA	Root Mean Square Error of Approximation
SDG	Sustainable Development Goal
SDG 4	Sustainable Development Goal 4
SERU	Safe, Effective, and Responsible Use of ICT
STEM	Science Technology Engineering and Mathematics
TIMSS	Trends in International Mathematics and Science Study
TLI	Tucker Lewis Index
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund

# Executive Summary

This report, titled “Digital Kids Asia-Pacific (DKAP): Insights into Children’s Digital Citizenship”, responds to the growing needs of Member States in the Asia-Pacific region to understand children’s knowledge, behaviour and attitudes in a hyper-connected digital world. It aims to create a data-driven, conducive educational and policy environment that maximizes opportunities that Information and Communications Technology (ICT) offers, while minimizing potential threats that the same may pose. The report was also developed in the context of the Education 2030 Agenda identifying digital skills as one of the key competencies for youth and adults to achieve and monitor until 2030 (UNESCO, 2015).

Supported by the Government of Korea Funds-in-Trust, in close cooperation with the International Telecommunication Union (ITU), the United Nations Children’s Fund (UNICEF) and Google, the analysis of the four-country survey that forms the basis of this report aims to address the following gaps: 1) a lack of research and thereby a dearth of baseline data in the Asia-Pacific region to understand children’s cognitive and socio-emotional capabilities and behaviours in the digital environment; 2) the limitations of current definitions and scopes of digital competencies, focusing on basic digital literacy, and 3) the dominance of the risk and safety paradigms in education policies and interventions around children’s use of ICT, to the neglect of other key aspects, such as empowering them to effectively participate, create and advance digital opportunities.

The work on the DKAP survey began by drawing upon a balanced perspective of *digital citizenship*, defined as “being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one’s own rights” (UNESCO, 2016).

Through extensive consultations with international experts and relevant United Nations (UN) agencies, the DKAP Framework proposes a comprehensive and holistic set of competencies across five domains: Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence, and Digital Creativity and Innovation. The framework is also anchored in a rights-based approach, in full recognition of the United Nations Convention on the Rights of the Child (1989).

The framework was then used as the basis for the creation of a self-reporting survey to measure children’s digital citizenship competencies. The survey was administered to 5,129 students aged 15 in four Asia-Pacific countries – Bangladesh, Fiji, Republic of Korea and Viet Nam.

## Key Findings

### **Overall performance across the five domains**

Among the five domains, children were most confident in their Digital Safety and Resilience competencies, and least confident in their Digital Creativity and Innovation competencies across all four countries. Some domains showed homogeneous levels of competencies across the four countries, while others showed wider gaps between the countries. For example, students in all four countries showed similar levels of Digital Participation and Agency competency (from 2.98 to 3.04, 1 being the lowest and 4 being the highest) while each country demonstrated widely different competency levels in Digital Literacy (3.01 to 3.31) and Digital Emotional Intelligence (2.96 to 3.22). Girls in all four countries had significantly higher scores compared with boys across all five domains. Children from urban schools showed higher competencies in all five domains than those from rural schools.

### **Digital divides**

Apart from the competency questions, the survey asked a number of questions to gather insights on children's background, usage and access to the digital world. The findings indicated that different forms of digital divides existed. Digital divides manifested in very real ways for the surveyed students. A significant portion of Bangladesh and Fiji students reported that they had no access to any digital devices. In Bangladesh and Fiji, 8.5 per cent of students and 7.1 per cent of students respectively did not have access to any of digital devices at home. In contrast, those who did not have access to digital devices at home in Korea and Viet Nam dropped to 1.2 per cent and 0.8 per cent respectively. Digital divides were also notable in school as all four countries had a significant number of students with no access to the Internet at school (18–35 per cent). Regarding gender differences in access, more girls than boys had access to digital devices at home and school, and a higher proportion of girls compared to boys in all the countries had access to multiple digital devices at home and at school. One exception was in Bangladesh, where twice the proportion of girls did not have access to digital devices in school compared to boys.

All in all, access to digital devices *both at home and schools* was significantly associated with a positive effect on students' scores in all five domains when controlling for other factors. In other words, access to digital devices contributes to better performance of all five domains of digital citizenship competencies.

### **Children spend significant time online**

The amount of time per day that students use digital devices to access the Internet varied across countries. About one-fifth of students in Bangladesh and Fiji hardly ever used the Internet. In Korea and Viet Nam, more than 60 per cent of students accessed the Internet for more than three hours a day, and about 8 per cent spent more than seven hours a day online. There was a trend that students spent more time online or on the computer socializing with friends and for entertainment activities compared to studying and learning.

Overall, a greater duration of time spent online per day had a negative effect on the Digital Safety and Resilience domain among students across all four countries, whereas the same showed significant positive effects for Digital Literacy, Digital Participation and Agency, and Digital Creativity and Innovation.

### ***Domain-specific findings***

Student performances across the four countries varied under different domains and so did factors affecting the performances of each domain. In **Digital Literacy**, students in Korea had the highest score on average at 3.31, while students in Fiji had the next highest average score at 3.14. Students in Viet Nam had an average of 3.10, and students in Bangladesh reported an average of 3.01. The three factors that had a positive effect on this domain's score were the duration of students' experience with digital devices, the number of digital devices accessible to students at home, and whether students had developed a website or app (application).

In **Digital Safety and Resilience**, students in Korea had the highest score on average at 3.53, while students in Fiji had the next highest score at 3.45. Students in Viet Nam had an average of 3.35 and students in Bangladesh reported an average of 3.33. Overall, a negative association was found between students' Digital Safety and Resilience score and the amount of time spent using digital devices daily (i.e. the more they spent time online, the lower the Digital Safety and Resilience score was). The three factors that most positively affected students' scores in this domain were longer prior experience in using digital devices, higher numbers of digital devices accessible at home, and higher education levels of both parents.

In **Digital Participation and Agency**, students in Fiji had the highest score on average for this domain at 3.04, while students in Bangladesh had the next highest score at 3.02. Students in Viet Nam had an average of 3.00 and students in Korea reported an average of 2.98. The scores are remarkably similar across the countries. The factors that most positively correlated with students' scores in this domain were having previously developed a website or app, longer prior experience with using digital devices, and higher numbers of digital devices accessible at school.

In **Digital Emotional Intelligence**, students in Korea had the highest score on average for this domain at 3.22, while students in Fiji had the next highest score of 3.18, with students in Bangladesh having an average of 3.06 and students in Viet Nam reporting an average of 2.96. The factors that contributed most to student performance in this domain were having access to devices at home, having experiences in developing a website or app, and higher education levels of parents.

Finally, in **Digital Creativity and Innovation**, students in Korea had the highest average score of 2.76, while students in Viet Nam had a score of 2.74, students in Fiji had a score of 2.72, and Bangladesh had a score of 2.60. The factors that were most positively associated with the higher scores of students in this domain included a longer period of using digital devices a day, prior learning experiences in coding, and having experiences in developing a website or app.



## ***Teachers, parents and peers influence children's learning about the Internet and computers differently in each country***

The study showed that teachers in Bangladesh were a greater source for children's learning about computers, the Internet, and Internet safety than teachers in Fiji, Korea and Viet Nam. In comparison, children in Korea learned about similar things on their own, or from peers. Family and parents were cited by Fiji children most commonly as influences in learning about ICT. The ways that students reacted to potential risks in digital spaces varied, with Korean students least likely to seek help from teachers and parents.

Based on the findings, the study suggests the following **policy recommendations**:

- **Develop a holistic concept of digital citizenship that goes beyond digital skills and safety**
- **Encourage research that reflects children's voices in policy development**
- **Build student support systems with parents, teachers, peers, and siblings**
- **Embrace positive sides of screen time, but with caution**
- **Make a coordinated effort to close the digital divides**
- **Empower girls and focus on their talents**
- **Develop inter-sectoral partnerships to address identified challenges**

In conclusion, DKAP is a timely development that clarifies the definition of "digital citizenship" through the framework and measurement tool for education systems to assess progress towards improving digital citizenship among students in the Asia-Pacific region. Research in this area is still in an early stage and UNESCO notes that these concepts and measurement tools should continue to be elaborated on and further developed. It is highly desirable that not only international organizations, but also countries and non-governmental organizations, continue to explore and actively participate in the development of these concepts and measurement tools for digital citizenship. These skills and competencies are vital for all our futures.



# Introduction

The proliferation of ICT has led to a hyper-connected era beyond globalization (Al-Rodhan and Stoudmann, 2006; The Onlife Initiative, 2015) through increasingly affordable and ubiquitous access to digital devices and the Internet. In 2018, an estimated 3.89 billion individuals used the Internet (ITU, 2018). Among them, youth aged between 15 to 24 years old were the most connected age group in the world, with more than 70 per cent online (ITU, 2017).

Networked digital technologies provide opportunities that enable people, including children and youth, to express themselves as both consumers and producers of digital contents. Users are able to freely interact, share, and collaborate with reduced constraints of time and space. The use of technologies can assist in activities such as complex problem solving, creativity, and self-expression. Moreover, participation in the digital world creates a sense of agency, through which persons, including young people, may influence society (Swist et al., 2015).

While acknowledging the wide-ranging digital opportunities and benefits, we cannot ignore a variety of risks that the use of such technology and digital interactions may pose to children. Alongside the increased use of digital technologies are growing risks of negative influences such as cyberbullying, pornography, child sexual exploitation, fraud, and harmful technological habits (UNESCO, 2016). More recently, issues highlighted in the media include the proliferation of misinformation, data privacy concerns, and increased cybersecurity risks.

The key questions then are, how can we empower children to maximize the full potential of digital opportunities, while enabling them to grow resilient to harmful risks the same opportunities may pose? How can adults (governments, schools, parents) provide appropriate forms of guidance to children who have never lived without the Internet, and create a safe and enabling digital environment? What are the skills, knowledge and attitudes that children must embrace in order to help them be aware of and fully exercise their rights to participate

in a digital world, while their rights to be protected from any digital harms are also protected (Livingstone and Third, 2017)?

To answer these questions, we need a more comprehensive scope and definition of digital competencies that goes beyond ICT skills (UNESCO, 2016). This means encompassing cognitive and social-emotional capabilities to leverage opportunities afforded by the Internet for positive growth in areas such as skills to use ICT, collaborative skills, civic engagement, creative production, and respectful engagement with others, alongside the capacity to take appropriate steps to minimize and address threats.

In a recent study, UNESCO (2016, p. 15) articulated a broad definition of digital citizenship as *“being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one’s own rights.”*

While there have been sizeable initiatives to develop children’s ways of using, participating, collaborating and being creative in a digital world, a lack of baseline data can result in ill-informed interventions. The scarcity of comparable and reliable data is more acute in the Asia-Pacific region, with most existing research relating to industrialized Western nations in North America and the European Union (Common Sense Media Inc., n.d.; European Commission, n.d.; International Computer and Information Literacy Study, 2013; International Society for Technology in Education [ISTE], 2016; Organisation for Economic Co-operation and Development [OECD], 2016). While some research organizations such as Global Kids Online and UNICEF have expanded the knowledge base in the Asia-Pacific region, cross-national research data using instruments contextualized to the region is lacking. The need for evidence-based digital citizenship education policy development and implementation is also evident in a policy survey by UNESCO (2016), where 73 per cent of the 22 surveyed Member States across the Asia Pacific region reported that they did not have assessment programmes in place to measure the efficacy of their digital citizenship policies and procedures. In addition, little research has been carried out in Asia-Pacific countries on whether and how the socio-economic background of children affects their quantity and quality of ICT use, and the type of experiences they have.

Given the increasing pervasiveness of technology in school, work, and leisure, it is important for children to develop their cognitive and socio-emotional capabilities and behaviours in the digital environment for the present and foreseeable future. This is addressed by the concept of digital citizenship competencies which emphasizes a holistic view of the child, going beyond the child being viewed as merely a vessel to teach basic ICT skills. Fostering digital citizenship competencies will ensure that today’s children have the capacity to maximize the opportunities that ICT offers, while minimizing concomitant risks.

The DKAP study therefore aims to contribute to building a comprehensive and comparable knowledge base on children’s digital citizenship in the Asia-Pacific region. It defines core domains of digital citizenship competencies, establishes and validates a tool to assess the defined competencies and contributing factors, and reports the key findings from over 5,000 children across Bangladesh, Fiji, South Korea and Viet Nam.

## The Asia-Pacific context

The Asia-Pacific region<sup>1</sup> occupies approximately 22 per cent of the global land area, and the region's population of about 4.17 billion (2017) is about 56 per cent of the total world population. More than 1.1 billion of the world's children live in UNESCO's Asia-Pacific Member States, which together form a region with vast diversity in terms of social, economic, and technological contexts (UNESCO, 2016; UNICEF, 2017). Correspondingly, the region includes a wide diversity of societies with varied landscapes, climates, cultures, value and belief systems, religions, languages, and economies.

Such diversity is also reflected in the region's ICT development levels. The ICT Development Index (IDI) 2017 shows that the Asia-Pacific region has the widest range of scores compared to other regions (ITU, 2017). Scores range from 1.95 to 8.85, with 10 as the highest possible rating. Crucially, the greatest average rate of improvement for any indicator in the Asia-Pacific region was for mobile-broadband subscriptions, which increased by an average of 36.2 per cent between 2016 and 2017. Youth in the region are strongly connected to the Internet, reflecting similar trends globally. In 2017, an estimated 72.3 per cent of Asia-Pacific youth aged 15-24 years old used the Internet, compared to a much lower rate of 43.9 per cent in the total population (ITU, 2017).

At the same time, digital inequalities within and across countries exist across lines of gender, age, socio-economic status, geography, physical abilities, and educational background among other aspects (ITU, 2017; Broadband Commission, 2017). In particular, the gender gap in access to, and use of, ICT among women and girls has been and continues to be documented, and is a persistent challenge. In the Asia-Pacific region, the gap between higher Internet user penetration rates for males compared to females only decreased by 0.3 per cent over a period of four years – from 17.4 per cent in 2013 to 17.1 per cent in 2017. Lack of access to the Internet by women is connected to factors such as low education levels, living in remote areas, and lower income levels (World Bank, 2016). This pattern manifests in both developing and developed countries (ITU, 2017; Antonio & Tuffley, 2014). Other research over the past decade also shows that socio-economic status affects the access and quality of children's ICT use (Gasser et al., 2010).

## Digital citizenship and the Education 2030 Agenda

Reflecting the growing roles and integral nature of ICT in our lives, the Education 2030 Agenda identifies ICT as an essential tool to help achieve inclusive and equitable quality lifelong learning for all. It highlights ICT as a means “to strengthen education systems, knowledge dissemination, information access, quality and effective learning, and more effective service provision”. Logically, the Education 2030 Framework for Action underscores the importance of digital skills that citizens should acquire to confidently thrive in a globalized, knowledge-based and technology-

1 UNESCO's definition of the Asia-Pacific region consists of 46 Member States and 2 Associated Members. It follows the specific UNESCO definition which refers to the execution of regional activities of the Organization and may not be fully comparative to other definitions of the region. For more information: <https://bangkok.unesco.org/index.php/content/asia-and-pacific>.

driven world (UNESCO, 2015). It includes two indicators on digital skills to guide Member States' monitoring until 2030, namely 4.4.1 "proportion of youth and adults with ICT skills" and 4.4.2 "proportion of youth and adults who have achieved at least a minimum level of proficiency in digital literacy".

While the hard skills like basic ICT literacy are a prerequisite, equally pertinent, if not more so, in digital citizenship is the socio-emotional capability to understand, respect and act upon the notion that the world is connected and one's behaviour leads to intended/unintended consequences for others. This is highly related to UNESCO's Global Citizenship and Sustainable Development Goal (SDG) 4.7 (see Annex 10: SDG 4 Targets) which emphasizes the holistic development of cognitive, socio-emotional, and behavioural dimensions that support a young person in engaging responsibly with the wider society.

Meanwhile, the future of work continues to change in the context of transformative technology. Employers predict that these jobs will demand skills that include, as well as technological know-how, creativity, originality, critical thinking, and complex problem solving (World Economic Forum, 2018). This suggests that digital citizenship is set to be a core competency for decent jobs under SDG 8.

As underscored in SDG 4 and beyond, there is a need among all Member States to help children and youth develop digital citizenship competencies. The educational programmes and policies that foster such competencies should be built upon a solid knowledge base and an evidence-based understanding of children's behaviour, experiences, issues and perceptions in the digital space. In addition, educational programmes should include interventions that are most effective at addressing children's best interests and building these competencies.

By obtaining meaningful data that is relevant to the diverse contexts of a particular Asia-Pacific country, the education sector will be better placed to develop ICT interventions that are tailored to the exact issues faced by children.

## Project background

UNESCO, supported by the Government of the Republic of Korea Funds-in-Trust, responded to these issues by initiating the DKAP research study to assist Asia-Pacific Member States' development of evidence-based policies that foster children's digital citizenship and promote the safe, effective and responsible use of ICT. Four Member States took part: Bangladesh, Fiji, Republic of Korea, and Viet Nam. They were invited based on their various characteristics including population size, geographical location, level of ICT development, and education system.

Table 1 provides a snapshot of key statistical data of the four Member States:

**Table 1: Statistical data of the participating Member States in the DKAP research**

	Bangladesh	Fiji	Republic of Korea	Viet Nam
UNESCO Sub-region	South Asia	Pacific	East Asia	Southeast Asia
Official language	Bangla	English	Korean	Vietnamese
Total population (2017)	164,669,751	905,502	50,982,212	95,540,800
GDP per capita (US\$)	1,516.5	5,589.4	29,742.8	2,342.2
<b>Key Youth Indicators</b>				
Child population (below 18 years old)	56,869,000	303,000	8,678,000	25,780,000
Percentage of children in total population	34.5	33.5	17.0	27.0
Youth population (15-24 years old)	31,320,000	153,000	6,744,000	15,799,000
Percentage of youth in total population	19.0	16.9	13.2	16.5
Youth literacy rate	93.0 (2017)	n.a.	n.a.	97.1 (2009)
<b>Key ICT Indicators, 2017</b>				
Percentage of individuals using the Internet	18.0	50.0	95.1	49.6
Mobile-cellular telephone subscriptions per 100 inhabitants	91.7	114.2	124.9	125.6
Fixed-broadband sub. per 100 inhabitants	4.4	1.3	41.6	11.8
Active mobile-broadband sub. per 100 inhabitants	30.7	55.7	112.8	47.0
Percentage of households with computer	11.1	44.6	80.0	21.6
Percentage of households with Internet access	19.4	35.9	99.9	27.3
<b>Key Education Indicators</b>				
Net enrolment rate in Primary	90.5 (2017)	97.2 (2016)	96.1 (2016)	98.0 (2013)
Net enrolment rate in Secondary	61.6 (2017)	83.4 (2012)	97.4 (2016)	n.a.

**Sources:** Produced by UNESCO Bangkok based on data from The World Bank database 2017, UNESCO Institute for Statistics, UN Department of Economic and Social Affairs, and the International Telecommunication Union.

## **Objectives of the study**

This study aimed to address existing knowledge gaps in the Asia-Pacific region regarding children's digital citizenship competencies by achieving the following:

- 1.** Create and release a statistically validated and reliable framework as well as the assessment tools to measure digital citizenship competencies
- 2.** Build a comprehensive baseline from the four-country validation study to understand children's attitudes, behaviours, and uses of ICT within an educational context
- 3.** Identify factors that are associated with differences in children's digital citizenship competencies

## **Research questions**

To achieve those aims, the following research questions were developed:

"Do DKAP measures help assess the "digital citizenship competency" of Asia-Pacific students?"

Sub-research question:

- 1.** What are the criteria for measuring digital citizenship competency in the Asia-Pacific?
- 2.** Is the DKAP survey valid? If so, to what extent?
- 3.** Is the DKAP survey reliable? If so, to what extent?
- 4.** What are individual and contextual characteristics such as gender, family background, schools and local communities that are associated with 15-year-old students' digital citizenship competencies?
- 5.** What are the differences in 15-year-old students' digital citizenship competencies across countries?



## UNESCO Digital Kids Asia-Pacific (DKAP) Framework for Education

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This study builds upon the work of another recent initiative, in which UNESCO (2016) reviewed various existing frameworks for digital skills and citizenship in order to guide the design of a survey to examine Member States' policy readiness for fostering children's safe, effective and responsible use of ICT. While the survey results of 22 Member States in the Asia-Pacific region suggested a clear disparity in policy maturities, they also indicated the need for a balanced perspective on digital citizenship education between digital opportunities and risks.

The UNESCO study (2016, p. 15) offered a comprehensive definition of digital citizenship as

*"being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one's own rights."*

Recognizing that digital citizenship includes both the capacity to leverage opportunities and to minimize risks arising from digital technology, this definition was a guiding principle in the development of the UNESCO DKAP Framework for Education.

The framework was developed and refined over three rounds in partnership with regional and global non-governmental organizations (NGOs), international and regional experts from academia, research bodies and UN agencies:

- In the first round of consultations, an initial framework was proposed based on a literature review of eleven leading frameworks that fully or partially elaborated on concepts of digital citizenship in the context of education. These were critical to identifying the diverse features of digital citizenship competencies and their different dimensions. The analysis in Annex 1



presents a summary of the major findings of the existing frameworks. Based on this review, an initial framework was proposed at a conference on Digital Citizenship Education in Asia-Pacific held on 2-3 March 2017 in Bangkok, Thailand by UNESCO Bangkok and Google.

- ▶ A second round of consultations was conducted at an Experts' Meeting held on 24-26 July 2017 Bangkok, Thailand. The initial framework and provisional domains were refined by 24 participants from regional and global NGOs, academia, research bodies and UN agencies (e.g. UNESCO, UNICEF, ITU). At the conclusion of this experts' meeting, the DKAP Framework was refined into a set of five domains with corresponding competencies and sample performance indicators for the competencies.
- ▶ The third and final round of revisions was led by the lead research institute, the Institute of School Violence Prevention (ISVP) at Ewha Womans University, Seoul, Republic of Korea, which finalized the definitions for each domain and competency with a focus on consistency, clarity, and validity. A complete set of questions for a proposed related survey (the basis for the present report) was reviewed and discussed by ISVP and national research teams from four pilot countries; Bangladesh, Fiji, Republic of Korea, and Viet Nam, at the "Digital Kids Asia-Pacific: Regional Researchers' Meeting" held on 15-16 March 2018 at UNESCO Bangkok, Thailand.

A core principle guiding the development of the framework was a rights-based and child-centred approach, anchored in the 1989 Convention on the Rights of the Child. The framework consists of five competency domains, namely, Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence, and Digital Creativity and Innovation, all of which are essential for children to be able to exercise their rights to fully participate in a digital world while being aware of their rights to be protected from any digital harms (Livingstone and Third, 2017). In addition, while the entire research was to enable children's needs and voices to be heard (Article 12) in the process of developing the environment that will affect them, the framework reflected children's best interests (Article 3), protecting their privacy (Article 16), respecting their access to information and media of their choice (Article 17), and protecting them from violence (Article 19).

It may also be noted that the framework's five domains together focus holistically on the cognitive, behavioural and socio-emotional dimensions of children. The Digital Literacy, and Digital Creativity and Innovation, domains are oriented towards the cognitive aspect. The Digital Emotional Intelligence domain focuses on the socio-emotional aspect. The Digital Safety and Resilience domain focuses on cognitive and behavioural aspects, while the Digital Participation and Agency domain focuses on the behavioural aspect.

Under the five key domains, the framework contains 16 competencies (Table 2).

Table 2: UNESCO Digital Kids Asia-Pacific Framework for Education

Principles	Rights-based, child-centred approach
Prerequisite	Equity in quality of access to ICT
<p><b>Domain 1: Digital Literacy</b></p> <p>Digital Literacy refers to the ability to seek, critically evaluate and use digital tools and information effectively to make informed decisions.</p>	
Competencies	1.1 <b>ICT Literacy:</b> The ability to manage and operate ICT hardware and software responsibly in digital environments to access and search for data, information and content, and to utilize them.
	1.2 <b>Information Literacy:</b> The ability to seek, critically evaluate and use digital information effectively to make informed decisions.
<p><b>Domain 2: Digital Safety and Resilience</b></p> <p>Digital Safety and Resilience refers to the ability of children to protect themselves and others from harm in the digital space.</p>	
Competencies	2.1 <b>Understanding Child Rights:</b> The ability to understand legal rights and obligations within the global and local context.
	2.2 <b>Personal Data, Privacy and Reputation:</b> The ability to understand how to use and share personally identifiable information while being able to protect oneself and others from harm. Be able to implement strategies for information and device security and personal security protocols.
	2.3 <b>Promoting and Protecting Health and Well-Being:</b> The ability to identify and manage health risks, and use digital technology in order to protect and improve the physical and psychological well-being of oneself and others.
	2.4 <b>Digital Resilience:</b> The ability to be preventative, reactive and transformative, allowing young people to avoid or cope with the risky situations they face, and improve themselves.

### Domain 3: Digital Participation and Agency

Digital Participation and Agency refers to the ability to equitably interact, engage and positively influence society through ICT.

<b>Competencies</b>	3.1 <b>Interacting, Sharing and Collaborating:</b> The ability to interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals.
	3.2 <b>Civic Engagement:</b> The ability and willingness to recognize, seek out, and act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use.
	3.3 <b>Netiquette:</b> The ability to demonstrate ethical and courteous behaviour to inform choices in interacting and engaging with other people in different digital environments and with diverse audiences.

### Domain 4: Digital Emotional Intelligence

Digital Emotional Intelligence refers to the ability to recognize, navigate and express emotions in intrapersonal and interpersonal digital interaction.

<b>Competencies</b>	4.1 <b>Self-Awareness:</b> The ability to use introspection to explain one's moods, emotions, drives, and how these affect oneself and others in the digital context.
	4.2 <b>Self-Regulation:</b> The ability to manage emotions, moods and impulses during online engagements.
	4.3 <b>Self-Motivation:</b> The ability to demonstrate initiative, and a commitment to attain internal or external goals despite setbacks.
	4.4 <b>Interpersonal Skills:</b> The ability to build positive online relationships to communicate, build rapport and trust, embrace diversity, manage conflicts and make sound decisions.
	4.5 <b>Empathy:</b> The ability to demonstrate awareness and compassion for the feelings, needs and concerns of others during digital interactions.

### Domain 5: Digital Creativity and Innovation

Digital Creativity and Innovation refers to the ability of children to express themselves and explore through the creation of content using ICT tools.

<b>Competencies</b>	5.1 <b>Creative Literacy:</b> The ability to apply skills and use tools to create, adapt and curate digital content.
	5.2 <b>Expression:</b> The ability of a young person to use technology to represent or creatively express their identity.



## Methodology

Following the finalization of the DKAP Framework, work began to carry out the survey of the digital citizen competencies of 15-year-old students in the four Asia-Pacific countries.

This section describes the research methodology, including item development, sampling of participants, data collection procedures, and statistical validation of the assessment items. All important decisions at each step were carefully made based on mutual agreement of all parties including the regional lead researchers, national research team, project team, partners, experts, and other relevant stakeholders. A summary of the overall procedure is shown in Figure 1.

**Figure 1:** Data collection and analysis procedure.

<b>Survey Development</b>	Survey items development
	Expert review/Field trial
	Development of guidelines for pilot countries
<b>Pilot Test</b>	Field testing
	Finalization of survey items
<b>Data Collection</b>	[National teams] translation
	Data collection
	Focus group interview (optional)
<b>Data Analysis</b>	Data analysis and result comparison

## Target age group

While being fully aware of the importance of early intervention and education, the project team focused the survey on 15-year-old students for the following reasons. First, it was envisioned that the tool would assist Member States in monitoring indicator 4.4.1 of the Sustainable Development Goals (i.e. the proportion of youth and adults with ICT skills). The target age group is appropriate as the UN defines youth as persons between the ages of 15 to 24 years. Second, considering the diverse ICT development stages in the Asia-Pacific region, strategically targeting older children could contribute to mitigating potential gaps in access to and use of digital devices in the short-term. Third and finally, this enabled the data collection process to be simplified to minimize any procedural complications and to allow for easy replication by Member States. The involvement of younger children could have required additional time and resources such as parental presence in data collection, special training for data collectors, and the need to factor in varying reading proficiencies of children.

## Survey item development

Through extensive iterative engagement between ISVP, UNESCO Bangkok and the national research teams, the framework was translated into a self-reported survey for assessing the actual perception, behaviours and attitudes of children towards the digital environment in education settings. The initial set of questions was developed by ISVP and UNESCO Bangkok, drawing on a literature review and contextualized from existing survey instruments (Baron-Cohen and Wheelwright, 2004; Bock and Kim, 2002; Bunz, 2004; Carretero et al., 2017; Choi et al., 2017; Global Kids Online, 2016; Gupta et al., 2010; Fraillon et al., 2013; IEA 2015; Jones and Mitchell, 2016; Kirby et al., 2010; Leung, 2007; Moely et al., 2002; OECD, 2003; Ribble and Bailey, 2007; ThinkYoung, 2016; van Deursen et al., 2014; van Deursen et al., 2015; van Deursen et al., 2016; Warren et al., 2014; Weiser, 2000; Wood and Glass, 1996). Considering the cognitive capacity and attention spans of children, a main principle of the survey development was to minimize the number of questions without missing essential aspects of each competency. Wording of the items was carefully considered and refined in order to avoid any misinterpretation by the target age group.

In all, 104 items were included in the final set of questions. Table 3 outlines the composition of questions. The full survey questionnaire is in Annex 2, and training slides and the research checklist are shown in Annex 3.

**Table 3: Summary of survey questions by category and number.**

	Category of questions	Number of questions
A	Digital Literacy	14
B	Digital Safety and Resilience	18
C	Digital Participation and Agency	12
D	Digital Emotional Intelligence	16
E	Digital Creativity and Innovation	11
F	Student background	8
G	Access to and usage of digital devices	18
H	Socio-economic status (SES)	7
	Total	104

For example, Section B covers Digital Safety and Resilience, and uses 18 questions to measure whether and to what extent a child is aware of his/her own rights, is able to protect his/her privacy and promote digital well-being, and is resilient to potential risks that the digital world may pose. Questions include: "I try to protect my personal information from others online", "I know which information I should and should not share with others on the Internet", "I find myself using digital devices longer than intended", "I can ask a person to stop sending unwanted and disturbing messages or emails" and "How would you react when you find that your personal information is misused, compromised and acquired without your permission?".

In addition to competency questions, additional sections obtain background information of respondents as possible predictors of students' digital citizenship competency, including demographic information, access and usage of digital devices at home, school and community, and questions to indicate their socio-economic status.

**Figure 2: Survey item development procedure**

The development process for the survey items is outlined in Figure 2. Prior to the main data collection, the ISVP team conducted a field test in February 2018, using Korean samples and the Korean language. The sample size was approximately 269 students from two secondary schools located in Seoul. One of the purposes of the field trial was to test the reliability and validity

(construct validity) of the survey questions, with a confirmatory factor analysis conducted thereafter. The results showed that the reliability of each variable was considered statistically sufficient. The field trial revealed that it took participating students approximately 30 minutes to complete the main questionnaire and there was no specific item having a high level of missing data.

## Sampling

According to the anticipated response rates and other factors affecting students' participation in the survey, each national research team (NRT) selected a sample size appropriate for their countries. The minimum required number of completed surveys was agreed to be 1,000 per country.

The desired target population in each country consisted of 15-year-old students who were:

- ▶ Attending an educational institution in grade 8 and higher;
- ▶ Enrolled full-time in an educational institution;
- ▶ Not limited in their questionnaire proficiency through language, or intellectual or physical disability.

A stratified two-stage cluster sampling was used in order to ensure the representativeness of target populations in different possible subgroups and to reduce standard errors. Examples of units of subgroups were geographic region, urbanization level, gender, public/private status, and performance level. Stratification types varied by country, reflecting different circumstances and important demographic variables. Each country team was responsible for sampling to ensure representation of the full target population of 15-year-old students across the country. In the first stage, samples of schools were selected from the explicit stratum (e.g. urban vs. rural). During the second stage, classes of target-grade students were randomly selected from each participating school. For example, ten urban and ten rural schools were selected in the first stage of the South Korean data. In the second stage, two classes from each school were randomly selected. Throughout the sampling process, samples were carefully selected to reflect the proportion of the gender and public/private status of schools in the population.

The final set of participants in the validation study is shown in Table 4.

**Table 4: Summary of the survey respondents by country characteristics and by gender.**

	Bangladesh	Fiji	Korea	Viet Nam
Sub-region	South Asia	Pacific	East Asia	Southeast Asia
Researchers	Directorate of Secondary and Higher Education (DSHE)	Ministry of Education, Heritage and Arts (MOEHA)	Institute of School Violence Prevention (ISVP), Ewha Womans University	Viet Nam Institute of Educational Sciences (VNIES)
Sample size	1,055 children Girls: 49.9%	1,239 children Girls: 57.7%	1,784 children Girls: 51.5%	1,051 children Girls: 53.1%
City/province	Barisal, Sylhet, Chittagong, Khulna, Rajshahi, Dhaka, Mymensingh, Comilla	Central Division, Western Division, Northern Division	Seoul, Incheon, Gyeonggi-do, Sejong, Chungcheong-nam-do	Da Nang, Ha Noi, Lao Cai, Lam Dong, Can Tho
Official language	Bangla	English	Korean	Vietnamese

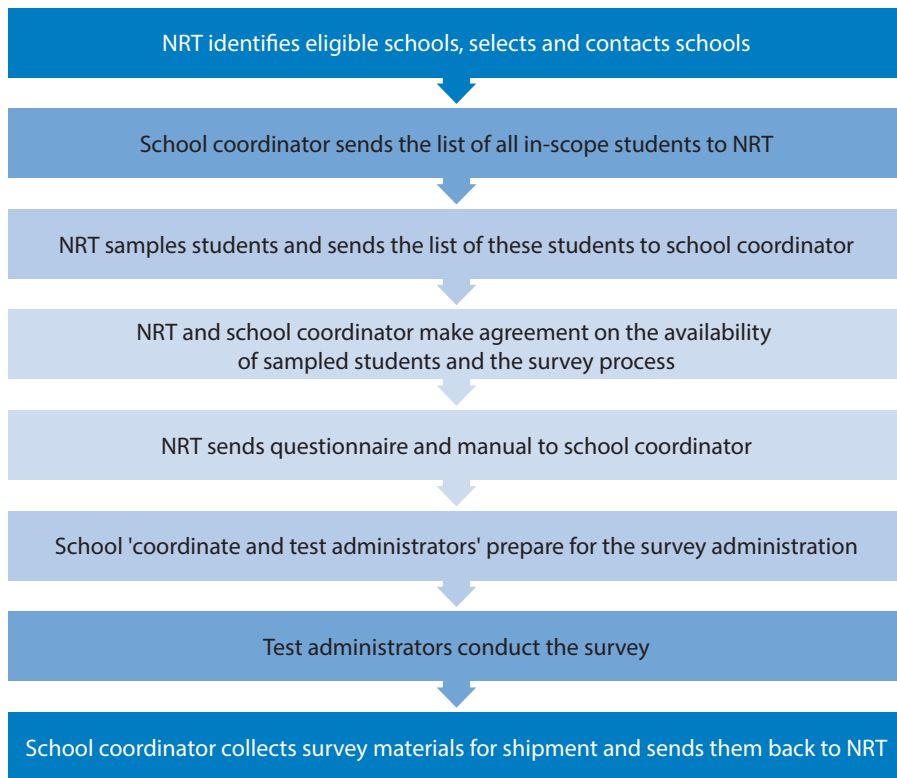


## Data collection

The data collection was carried out by all four NRTs between June and September 2018, through the use of paper-based surveys. This was mainly to provide equal access to the survey regardless of access to digital devices or the Internet, avoiding any potential preclusion of underprivileged populations.

The data collection process is described in Figure 3.

**Figure 3:** Data collection and field operation procedures.



Based on the agreed-upon sampling method, each NRT was responsible for identifying eligible schools and select the participating schools. Once participating schools were selected, the NRT sent a student listing form to each school coordinator to request information on all eligible target-grade students in the school, with their demographic information including age, gender, and exclusion status. Based on the list received from the schools, the NRT selected the sample students and sent the list of sampled students to the school coordinators, and the NRT and the school coordinator came to an agreement on the availability of initially sampled students. Where a student in the sample pool did not want to participate in the survey for any reason,

the NRT and school coordinator prepared a list of replacement students with similar sampling backgrounds.

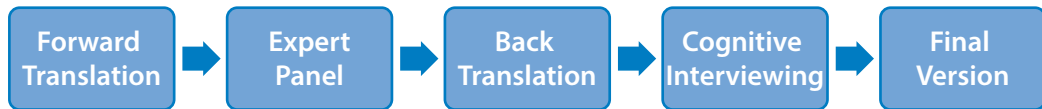
The survey was administered in different languages, as shown in Table 5, while the master questionnaire was developed and finalized in English.

**Table 5: Survey languages by country.**

	Bangladesh	Fiji	Korea	Viet Nam
Data collection period	August 2018	June 2018	July-August 2018	September 2018
Language of survey	Bangla	English	Korean	Vietnamese

Language translation was carried out through a rigorous process, including forward translation, expert panel review, back translation and cognitive interviewing. The process is shown in Figure 4. Translators aimed to provide the conceptual equivalent of a word or phrase, instead of a word-for-word translation. They carefully considered the definition of the original term and attempted to translate it in the most appropriate way.

**Figure 4: Survey translation process .**



A standardized time allocation was suggested across countries, shown in Table 6. However, if all of the students completed their surveys before the allocated time, the survey administrator could end the session sooner.

**Table 6: Survey time allocation.**

Activities	Length (approximate)
Preparing students, reading of instructions, and administering tutorial	10 min.
Administering the questionnaire (student response time)	45 min.
Collecting the instrument materials and ending the session	5 min.
Total	60 min.

## Ethical considerations

All aspects of methodology and the approaches to survey implementation were discussed and agreed with UNESCO Bangkok, to ensure that the study was conducted in an ethical manner. Survey participants were made aware of the purpose of the research and the expected end-usage of their data. This information helped participants to decide whether or not to take part. A data privacy disclosure was displayed at the beginning of the survey questionnaire with the following statement: "Your answers will be combined with answers from other students to calculate totals and averages. All information (or responses) you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose." Participants' names were not requested so that it would not be possible to link responses to individual children.

In addition, all of the countries obtained consent from either/both parents and/or the child to conduct the survey. Parties were informed about the anonymity and confidentiality of all responses. Also, the research teams informed school administrators, parents, and communities about the purpose and contents of the survey.

## Survey validation: Reliability and Validity

One of the purposes of DKAP is to develop a valid and reliable survey instrument that can be used by countries to measure aspects of the digital citizenship competencies of 15-year-old students. It will enable countries to obtain solid evidence of strengths and weaknesses of the students in the various digital citizenship competencies, thereby inform the education policy in prioritizing the lacking competency areas.

The survey therefore was tested and validated in view of the two critical aspects, validity and reliability. The validity and reliability of the survey were measured using a variety of statistical measures. Cronbach's alpha coefficient was used to assess the internal consistency of the competencies within each domain. The mean correlations between competencies within each domain were also measured to understand to what extent the competencies were related, while ensuring they were not identical (Watson, 2001).

### Reliability

The competencies within each domain have relatively high internal consistency, given that Cronbach's alpha coefficient of 0.70 and above is normally considered acceptable (Kline, 2000). However, Kline (2000) also states that 0.50 can be used as the cut-off when a small number of items is used to measure the same construct as Cronbach's alpha is heavily influenced by the number of items involved. The Cronbach's alpha for each domain ranges from 0.687 (Digital Safety and Resilience) to 0.868 (Digital Emotional Intelligence).

However, the Cronbach's alpha of items measuring the 'Promoting and Protecting Health and Well-Being' competency (B9 – B11) under the Digital Safety and Resilience domain was extremely low, and negative (-0.017), across all four countries. This indicates that these competencies are

not internally consistent and should be substituted with other questions that measure relevant concepts in future research (suggested questions are listed at Annex 2).

Overall, across five domains, the Cronbach's alpha for all four countries was acceptable. Korea was 0.850-0.916, Bangladesh was 0.827-0.877, Fiji was 0.735-0.837, and Viet Nam was 0.681-0.797.

The mean-correlations between competencies within each domain were relatively moderate ( $r = 0.341 \sim 0.625$ , significant at .01 alpha level (two-tailed test)), indicating that the scale used measured distinct but related constructs (Watson, 2001), except for a low correlation between 'Civic Engagement' and 'Netiquette' ( $r = 0.192$ ) in the 'Digital Participation and Agency' domain. Owing to the problematic internal consistency of the 'Promoting and Protecting Health and Well-Being' competency, noted above, that competency also had very low correlation coefficients when compared with the other competencies ( $|r| = 0.37 \sim 0.76$ ) (see Annex 4).

The DKAP survey can be considered reliable given the analysis of Cronbach's alpha coefficient and mean correlations analysis.

### **Validity**

In addition to the reliability tests above, Model Fit tests and Confirmatory Factor Analysis (CFA) were used to statistically assess how well the survey measured the constructs in each of the domains. CFA for each of the items and the competencies were measured to assess convergence validity and discriminant validity of the survey. Convergence validity is shown when each measurement item correlates strongly with the others. Discriminant validity is shown when each measurement item correlates weakly with all other constructs except for the same hypothesized construct. Convergence validity is verified by analyzing whether the factor loadings exceed 0.50 and are significant, while discriminant validity is verified when all correlations between each sub-competency in a specified dimension of competency are lower than 0.85 (Clemence et al., 2005).

Overall, all five domains show 'acceptable' to 'good' model fit, across a range of measures. All the competencies across the domains were found to have convergence validity and discriminant validity, other than between the 'Personal data, Privacy and Reputation' competency and 'Digital Resilience' competency, where the correlation coefficient of 0.991 exceeds 0.850.

The complete tables and figures for internal consistency, mean correlations, and CFA can be found in Annex 4.



# 4

## Findings

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This section presents the key findings from the survey analysis.<sup>1</sup> Student responses were scored on a range of 1 (disagree a lot), 2 (disagree a little), 3 (agree a little) and 4 (agree a lot) for their responses to questions on the five domains.

### **What is the overall performance of students across four countries?**

Korea had the highest mean scores in four domains: Digital Literacy, Digital Safety and Resilience, Digital Emotional Intelligence, and Digital Creativity and Innovation. Interestingly, the country showed the lowest mean for Digital Participation and Agency, the domain in which Fiji students showed the highest competencies. Bangladesh had the lowest means in three domains: Digital Literacy, Digital Safety and Resilience, and Digital Creativity and Innovation, while Viet Nam showed the lowest in Digital Emotional Intelligence.

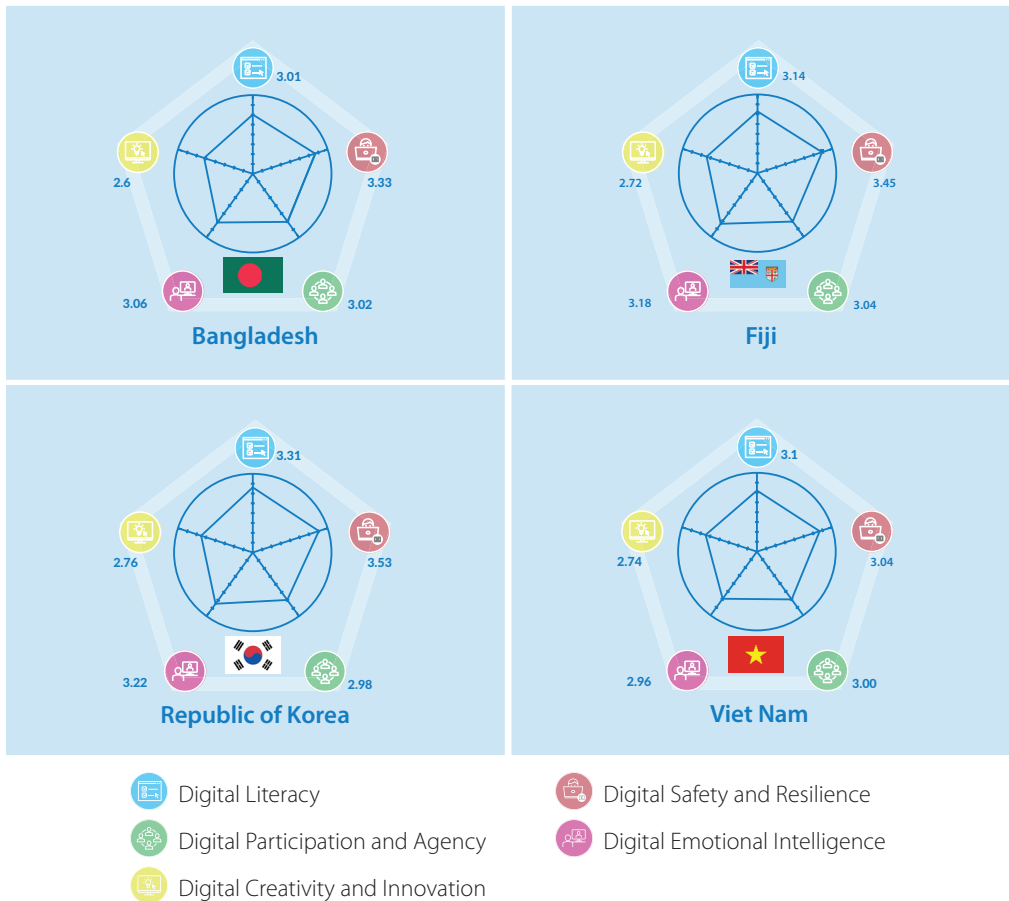
The multi-country nature of the survey allowed for a comparative analysis of the trends in what student respondents self-reported. Students in all four countries reported the highest competencies in Digital Safety and Resilience while showing the lowest competencies in Digital Creativity and Innovation (Figure 5). (The detailed tables of all countries' mean-values is in Annex 5.)

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<sup>1</sup> Note that "students" in this section refers to the participating or surveyed students unless otherwise indicated.

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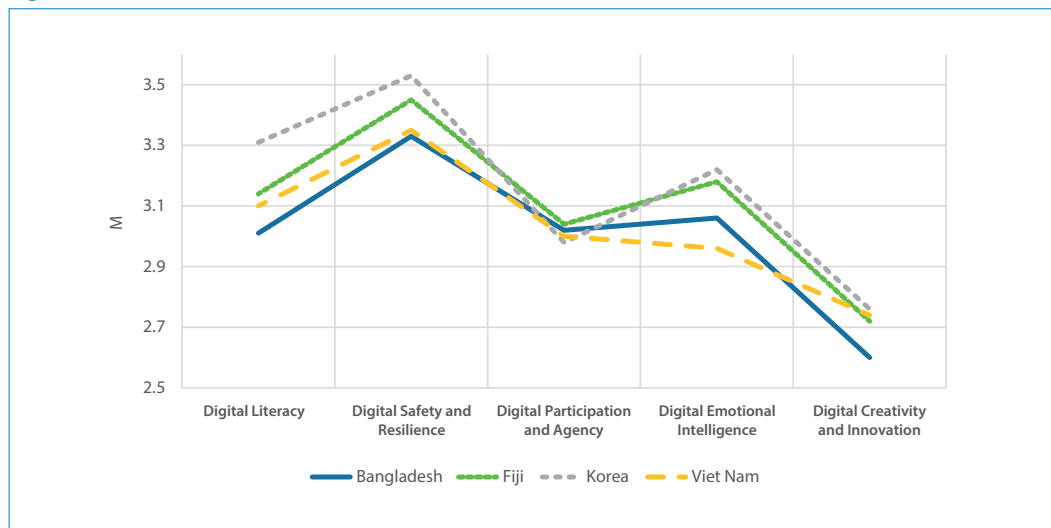
Figure 5: Overall mean score of each domain by country.



These overall findings suggest that current educational programmes on digital citizenship overly focus on digital safety issues, leaving little attention to digital participation and creativity, core competencies in a digital society. This finding is in line with Livingstone, Haddon, and Görzig (2012) who found that while most students are skillful in basic activities, fewer students progressively take up more creative and participatory activities.

Some domains showed homogeneous levels of competencies across the four countries, while others showed wider gaps between the countries. For example, students in all four countries showed similar levels of Digital Participation and Agency competency (from 2.98 to 3.04) while each country demonstrated widely different competency levels in Digital Literacy (3.01 to 3.31) and Digital Emotional Intelligence (2.96 to 3.22).

Figure 6: Overall trend of each domain.



## What factors affect students' digital citizenship competencies?

### Which devices do they mostly have access to?

Smartphones are by far the most accessible digital device at home in each country, as shown in Table 7. The percentage of students who have access to smartphones at home is 95.7 in Korea (highest) and 72.5 in Fiji (lowest). This finding is in line with the global trend of rapidly increasing mobile broadband subscriptions, from 4 subscriptions per 100 inhabitants globally in 2007 to 69 in 2017 (ITU, 2018).

**Table 7:** Percentage of students with access to digital devices at home, by country and type of device.

	Desktop computer	Laptop	Smartphone	Tablet PC	Printer	None of the above
Bangladesh	18.5	36.5	84.5	18.3	5.5	8.5
Fiji	23.8	53.1	72.2	39.9	20.5	7.1
Korea	67.9	63.5	95.7	38.7	58.4	1.2
Viet Nam	41.2	47.7	92.1	31.4	11.7	0.8

For Bangladesh, Fiji and Viet Nam, laptops were the second most frequently reported devices accessible to students at home, with 36.5 per cent of students in Bangladesh, 53.1 per cent of students in Fiji, and 47.7 per cent of students in Viet Nam saying they had this access. Laptops came a close third in Korea at 63.5 per cent, just under desktop computers at 67.9 per cent.

Overall, gender differences were seen in the higher proportion of girls compared to boys that have access to digital devices at home. About 3.5 per cent of girls did not have access to a digital device at home, while 4.3 per cent of boys did not. A higher proportion of girls in all the countries had access to 3-5 digital devices at home compared to boys.

Digital divides manifested in very real ways for the surveyed students. A significant portion of Bangladesh and Fiji students reported that they had no access to any of the five digital devices (i.e. desktop computer, laptop, smartphone, tablet PC, printer). In Bangladesh, 8.5 per cent did not have access to any of these digital devices at home, while the figure was 7.1 per cent of students in Fiji. In contrast, only 1.2 per cent of students in Korea and 0.8 per cent of students in Viet Nam did not have access to any of these digital devices in their home.

The results (Table 8) suggest that schools do not currently bridge the gap in access related to students' ICT availability at home, as many more students reported that they did not have access to any digital devices at school. The results also revealed gender differences in access to digital devices in school. Overall, about 12 per cent of girls did not have access to digital devices in school compared to 13.6 per cent of boys. About 51.5 per cent of girls had access to 2-5 digital devices in school, compared to 45.8 per cent of boys. Almost 10 per cent more boys reported having access to 1 digital device compared to girls, which is a marked difference not seen for the other categories of responses.

**Table 8: Percentage of students with access to digital devices at school, by country and type of device.**

	Desktop computer	Laptop	Smartphone	Tablet PC	Printer	None of the above
Bangladesh	62.3	57.1	15.6	6.1	30.7	14.9
Fiji	68.7	28.5	13.5	10.9	50.5	18.2
Korea	54.7	25.9	71.2	14.9	35.1	7.8
Viet Nam	64.8	5.1	38.0	3.0	5.2	14.6

A further analysis reveals that access to digital devices at home and schools is significantly associated with a positive effect on students' scores in all five domains when controlling for other factors (Annex 6). One exception was seen in access to digital devices in school and students' scores in Digital Safety and Resilience. This insight provides important information for policy-makers regarding key areas for potential policy interventions to foster digital citizenship among children, such as coordinated efforts to provide equal access to digital devices.

Close examination of country-specific results reveals departures from the above trend that can contribute to development of more targeted, evidence-based policies. In Bangladesh, about 19.5 per cent of girls did not have access to digital devices in school, more than double that of boys at 8.1 per cent. In Viet Nam, Korea and Fiji, a higher proportion of boys reported they had no access to digital devices in school compared to girls, with a difference of between 3 and 9 per cent more boys compared to girls. This finding implies that Bangladesh could focus efforts



on equalizing access to digital devices in public schools between girls and boys, while Fiji, Korea and Viet Nam could examine the reasons why boys have less access to digital devices in school and develop policies to address this gender gap.

The contrast in accessibility to digital devices between home and school suggests that education systems are lagging behind developments in accessibility to ICT in wider society. This may have implications on students' perceived lack of relevance of learning in school to the wider technology-mediated society.

All four countries had a significant percentage of students who had no access to any digital devices in school: 14.9 per cent in Bangladesh, 18 per cent in Fiji, 14.6 per cent in Viet Nam, and 7.8 per cent in Korea. In all countries except Korea, the desktop computer was the most accessible digital device in school as reported by 62.2 per cent to 68.7 per cent of students. In Korea, over 70 per cent of students could access smartphones in school.

Regarding the accessibility of digital devices in the local community, over 50 per cent of Bangladesh students had access to a desktop computer, a laptop and/or a smartphone. Over 30 per cent of students in Fiji reported a similar pattern of access. Smartphones and desktop computers were the two most accessible devices in the local community for Korea and Viet Nam, with lower access to laptops (Table 9).

Up to one-third of students in Fiji and Viet Nam did not have access to any digital devices in their local community, while in Korea the number was one-quarter and in Bangladesh, one-fifth.

**Table 9: Percentage of students with access to digital devices in the local community, by country and type of device.**

	Desktop computer	Laptop	Smartphone	Tablet PC	Printer	None of the above
Bangladesh	54.4	50.5	53.4	19.4	31.8	19.3
Fiji	33.8	30.8	33.3	17.7	26.1	33.1
Korea	56.1	19.6	49.3	15.8	35.4	25.2
Viet Nam	27.2	12.8	46.2	7.5	5.6	32.7

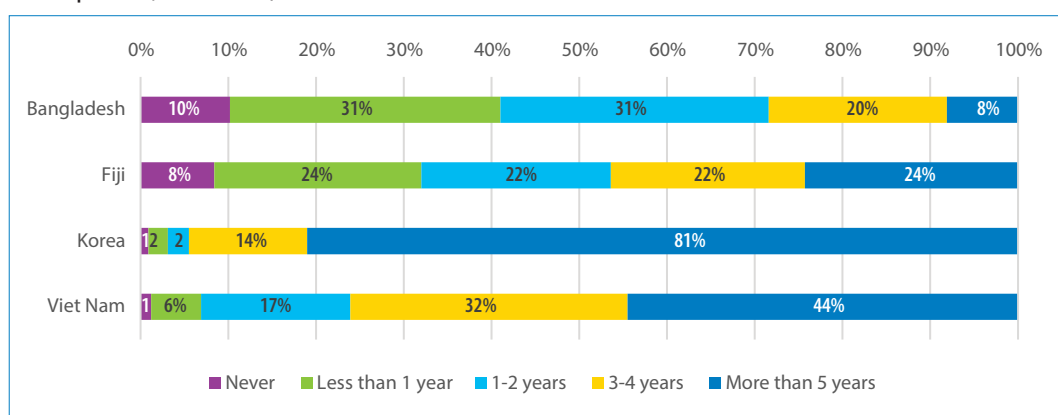
In addition, the accessibility of wired/wireless Internet generally varied according to location. More than 97 per cent of students in Korea and Viet Nam had access to the Internet at home, while the figure for Bangladesh was 78.8 per cent, and 73 per cent in Fiji. Schools did not appear to be a place that closed access gaps to the Internet as significant percentages of students in all four countries had no access to the Internet at school; 18.6 per cent in Korea, 24.3 in Viet Nam, 24.1 in Fiji and 37.4 per cent in Bangladesh.

Considering ITU estimates that 70.6 per cent of Asia-Pacific youth aged 15-24 years old use the Internet (ITU, 2017), it is reasonable to suggest that youth gain access to the Internet more at home than at school.

### For how long have students used digital devices?

Across all four countries, there was a wide range in the length of time of students' use of digital devices (Figure 7). In Bangladesh, 10.2 per cent of students reported that they had never used any digital devices as of the time of the survey, and 30.8 per cent reported using digital devices for less than one year. In Fiji, 8.4 per cent of students had never used a digital device, while 23.6 per cent had used a device or devices for less than a year. This is a stunning result because, in other words, nearly 40 per cent of Bangladesh respondents had never used any devices until the age of 14. This was also true of 32 per cent of 14-year-olds in Fiji. This contrasts with about 3 per cent of respondents in Korea.

**Figure 7: Number of years of experience using digital devices (e.g., desktop/laptop, smartphone, tablet PC).**



The results also revealed significant gender differences in students' prior use of digital devices at their age. Overall, the proportion of girls who had never used digital devices before was almost half that of boys. About 3.4 per cent of girls had never used digital devices compared to 6.3 per cent of boys. This trend was repeated in every country where more boys than girls reported that they had never used digital devices at 15-years old. For full results articulated around gender, see Annex 7.

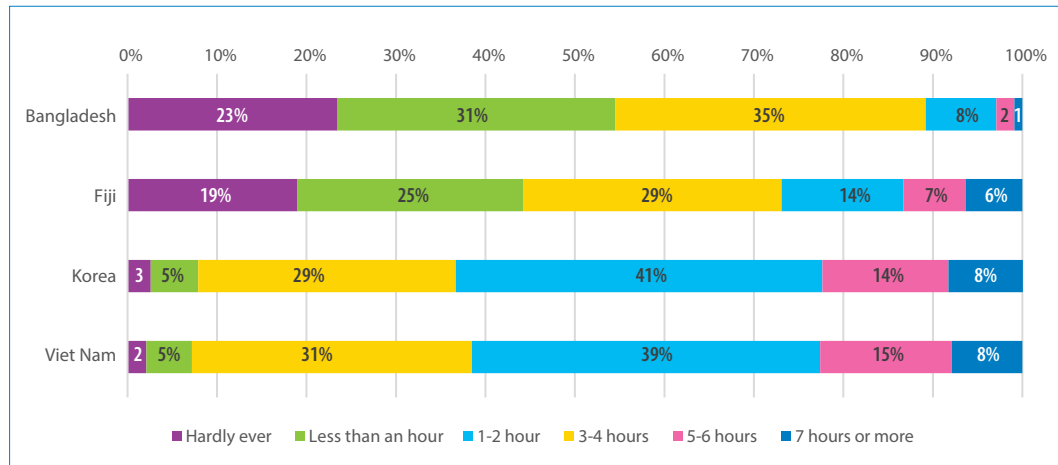
Larger percentages of students in Viet Nam reported that they had been using digital devices for longer than 5 years when compared to Bangladesh and Fiji. More than 30 per cent of students in Viet Nam reported having used digital devices for 3-4 years, while 44.4 per cent reported more than 5 years' use. Viet Nam's combined percentage in the categories of 3-4 years and more than 5 years was 76 per cent, compared to 28.3 per cent in Bangladesh and 46.3 per cent in Fiji.

Since longer durations of use of digital devices have a significant positive effect on students' levels of competencies in every domain, except for Digital Participation and Agency, it is critical that governments take steps to ensure that students have access to digital devices in the public education system and are supported in their exploration, expression and learning using such devices.

## For how many hours a day do children use digital devices?

The frequency of using digital devices to access the Internet per day varies across countries. For Bangladesh, more than one-fifth of students reported hardly ever going online or using the Internet, while about two-thirds reported going online or using the Internet from less than an hour to 1-2 hours per day. Similarly, one-fifth of students in Fiji reported hardly ever going online or using the Internet, while more than 60 per cent reported going online or using the Internet for less than an hour to 1-2 hours per day. Significantly, about 6.3 per cent of students in Fiji answered that they went online for more than 7 hours per day (Figure 8).

**Figure 8:** Length of time spent on the Internet using digital devices (e.g., smartphone, desktop/laptop, tablet PC) per day.



Korea and Viet Nam showed a different pattern, with the average respondent saying they spent significantly more time online per day. More than 60 per cent of students in Korea and Viet Nam went online or used the Internet for more than 3 hours a day. Within that group, 7.9 per cent of students in Viet Nam and 8.3 per cent of students in Korea spent more than 7 hours a day online. Globally, many children are spending significantly more time online, even just comparing data from the Programme for International Student Assessment (PISA) 2015 and this study in 2018. In 2015, 20 per cent of Korean students reported spending between 2-6 hours online outside of school (OECD, 2017). In 2018, 63.3 per cent of students in Korea under this study reported spending more than 3 hours a day online.

Overall, the duration of time spent online per day had a significantly negative effect on the Digital Safety and Resilience scores of students across all four countries. Students who spent more time online in a day had lower Digital Safety and Resilience scores when controlling for other factors. On the other hand, students who spent more time online reported significant positive effects on Digital Literacy, Digital Participation and Agency, and Digital Creativity and Innovation (see Annex 6).

## Does gender matter?

In contrast to the literature on self-assessment of digital skills, which has found that women and girls tend to rate their digital skills lower than men and boys do (Hargittai and Shafer, 2006; Sonck et al., 2012), the data from all four countries indicated that, except in a few instances, girls overall had significantly higher scores for all five domains. This is possibly due to the survey's measuring cognitive, socio-emotional and behavioural aspects of children, beyond just digital skills.

The higher performance of girls is also in line with their higher access to digital devices as shown earlier, which is a significant predictor of all five domains when controlling for other factors.

In the specific case of Digital Literacy, girls in Bangladesh and Korea reported higher scores compared to boys, while Fiji exhibited the opposite trend with boys reporting higher scores than girls. In Viet Nam, there was no statistically significant difference in Digital Literacy between girls and boys. (Table 10).

**Table 10: Correlation between gender and digital citizenship competencies by country.**

	Digital Literacy	Digital Safety and Resilience	Digital Participation and Agency	Digital Emotional Intelligence	Digital Creativity and innovation
Bangladesh	♀ <sup>***</sup>	♀ <sup>***</sup>	♀ <sup>***</sup>	♀ <sup>***</sup>	♀ <sup>***</sup>
Fiji	♂ <sup>*</sup>	-	♂ <sup>**</sup>	-	♂ <sup>***</sup>
Korea	♀ <sup>**</sup>	♀ <sup>***</sup>	♀ <sup>***</sup>	♀ <sup>*</sup>	-
Viet Nam	-	♀ <sup>*</sup>	♀ <sup>*</sup>	-	-

\* Level of statistical significance: \*\*\*p<.001, \*\*p<.01, \*p<.05.

♀ Female ♂ Male

For Digital Safety and Resilience, girls had higher scores on average in Bangladesh, Korea and Viet Nam. There was no significant difference between the scores reported by girls and boys in Fiji.

For Digital Participation and Agency, girls showed higher scores than boys in Bangladesh, Korea, and Viet Nam. In Fiji however, boys' scores were higher than girls'.

In the domain of Digital Emotional Intelligence, girls had higher scores than boys overall, with no country recording boys' scores higher than girls'. At the country level, girls in Bangladesh and Korea had higher scores than boys.

Lastly, on average, girls had higher scores for Digital Creativity and Innovation than boys. At the country level, only girls in Bangladesh had higher scores than boys, while in Fiji, boys had higher scores than girls.

### ***Does geographical location matter?***

In general, students from urban schools showed higher competencies in all five domains than those from rural schools, raising a concern regarding digital divides between urban and rural areas. However, there was a diversity in differences across countries in the analysis of rural-urban differences for each of the five domains. Bangladesh did not show any significant difference between students from urban and rural schools in any domain except for Digital Safety and Resilience.

In relation to Digital Safety and Resilience, being a student from an urban school was a significant predictor of a higher score, meaning that taking students as a total, overall, being from an urban school predicted a higher score for Digital Safety and Resilience.

For Digital Participation and Agency, a difference in this domain was only significant in Korea.

For Digital Emotional Intelligence, overall the students from urban schools had higher scores than those who from rural schools. At the country level, these differences were significant in Fiji and Korea.

For Digital Creativity and Innovation, students from urban schools had higher scores than those from rural schools. At the country-level, Korea and Viet Nam displayed similar patterns but, in contrast, Fiji provided evidence of an opposite pattern. Fijian students in rural schools had higher Digital Creativity and Innovation scores than their counterparts in urban schools.

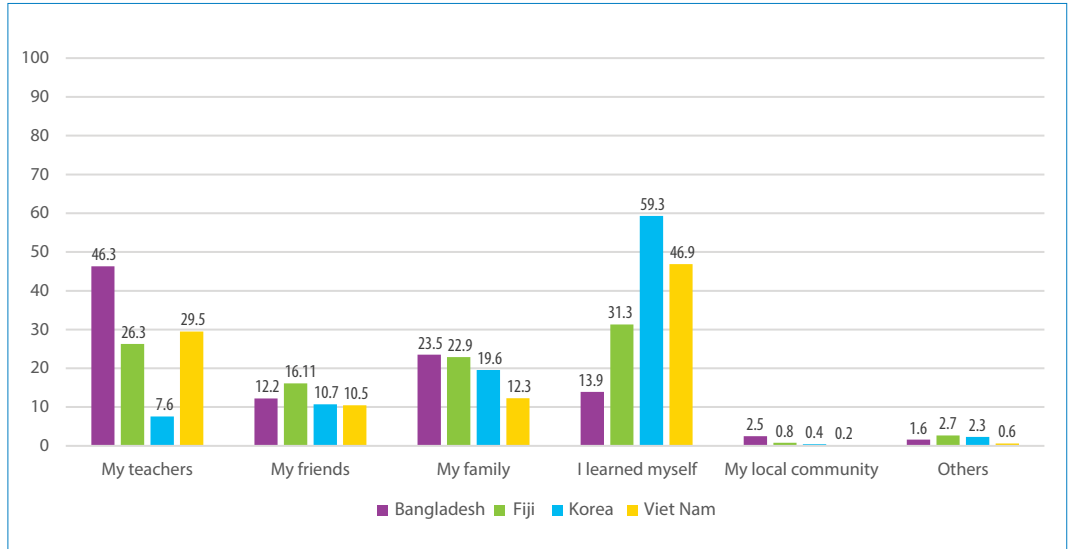
While there was a diversity of findings within each domain, the overall differences in competencies of students from urban and rural schools suggest that policy-makers should address the possible causes for such differences in rural schools and make an explicit effort to close the gaps by allocating financial resources, quality teachers, and support for school management and teacher professional development. For full results, see Annex 8.

### ***From whom do children learn about computers and the Internet?***

Since learning is a social act that takes place both in school settings and out of school, children's learning about ICT is also affected by various environmental factors. Research shows that the role of parents, peers, and other significant people in their lives contributes to the development of children's knowledge of online behaviour and their use of ICT devices (Punamaki et al., 2009).

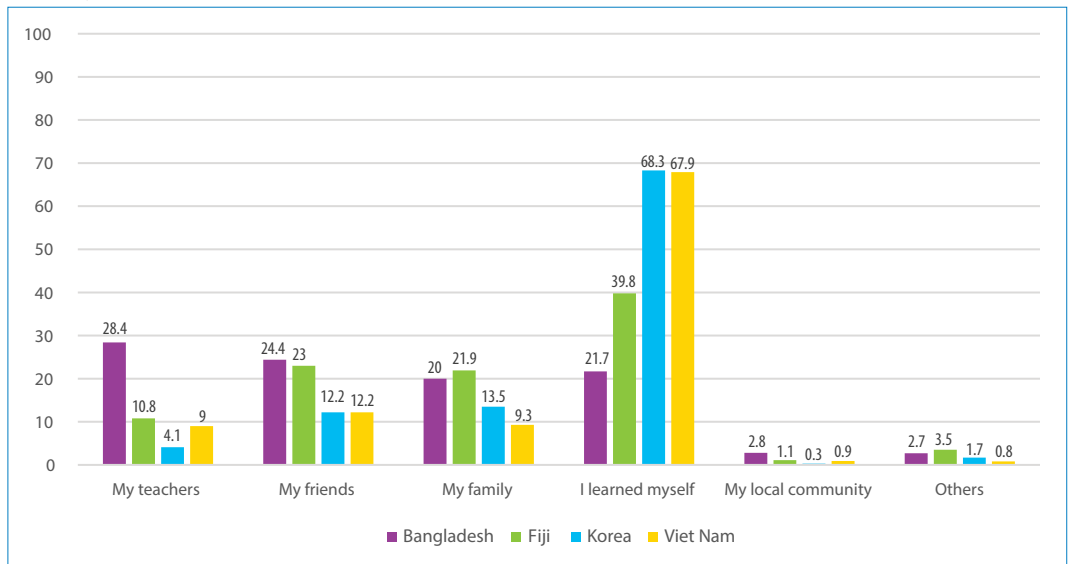
In regard to the role of influential others in students' usage of computers, Fiji, Korea and Viet Nam all showed a similar pattern in those students who learned how to use computers by themselves formed the highest proportion of respondents. More than 30 per cent said they learned by themselves in Fiji, 46.9 per cent in Viet Nam, and almost 60 per cent in Korea. For Bangladesh, in contrast, it was teachers who taught students most about using computers, with 46.3 per cent of students reporting learning from a teacher (Figure 9).

**Figure 9:** Percentage of students who were taught how to use computers, by country and source of learning.



When asked about who taught students the most about how to use the Internet, the pattern that emerged was similar to the findings concerning who taught them about computers. Students learned how to use the Internet by themselves in Korea (68.3 per cent), Viet Nam (67.9 per cent), Fiji (39.8 per cent) and Bangladesh (21.7 per cent). In Bangladesh the source of teaching was more evenly spread, across teachers (28.4 per cent), friends (24.4 per cent), family (20 per cent) and individuals (21.7 per cent) (Figure 10).

**Figure 10:** Percentage of students who were taught about how to use the Internet, by country and source of learning.



## Do teachers encourage students to explore or learn things using the Internet?

Student responses from each of the countries showed wide variation in crediting adults who encouraged them to explore or learn things using the Internet. Almost 70 per cent of students in Bangladesh reported that it was their teachers who encouraged them to explore or learn things on the Internet often, very often, or all the time (Table 11).

**Table 11:** Frequency at which students are encouraged to explore or learn things on the Internet, by country and type of stakeholder.

	Never	Hardly ever	Some-times	Often	Very often	All the time
<b>Parents/caregivers</b>						
Bangladesh	14.1	6.7	27.6	20.8	10.7	20.1
Fiji	12.8	13.0	29.7	11.9	7.5	25.1
Korea	17.8	16.3	26.7	21.1	6.8	11.3
Viet Nam	21.4	29.9	30.8	11.2	2.9	3.8
<b>Teachers</b>						
Bangladesh	3.6	3.9	23.4	34.2	16.0	18.9
Fiji	14.0	13.4	28.1	12.0	11.7	20.8
Korea	23.0	19.9	28.1	17.0	5.5	6.5
Viet Nam	6.7	18.0	32.9	30.2	6.5	5.7
<b>Siblings</b>						
Bangladesh	12.1	6.9	20.2	25.7	19.3	15.8
Fiji	17.4	15.5	27.8	15.0	10.8	13.5
Korea	33.4	17.0	22.0	14.8	5.8	7.1
Viet Nam	11.1	18.7	33.1	22.9	9.5	4.6
<b>Peers</b>						
Bangladesh	5.8	5.5	27.2	26.2	18.2	17.0
Fiji	18.0	12.7	26.3	12.0	10.0	21.1
Korea	19.5	14.2	28.5	21.8	8.4	7.6
Viet Nam	7.6	15.5	30.5	27.6	12.1	6.6

In contrast, about 72 per cent of students in Korea reported that their teachers only encouraged them to use the Internet to explore things sometimes, hardly ever or never. Korea had the highest proportion of students who said that their teachers never encouraged them to explore or learn things on the Internet.

Students in Fiji had the highest proportion reporting that their teachers encouraged them all the time, with more than one-fifth doing so. In Viet Nam, about 60 per cent of students reported that their teachers encouraged them sometimes or often, with the smallest percentage of these students identifying the extremes of teachers never encouraging them or encouraging them all the time.

### ***Do parents encourage students to explore or learn things on the Internet?***

Students in Bangladesh, compared with those in Fiji, Korea and Viet Nam, had the highest proportion reporting that their parents encouraged them to explore and learn things on the Internet. More than 50 per cent of students in Bangladesh reported this, compared with about 45 per cent in Fiji, about 39.2 per cent in Korea, and 17.9 per cent in Viet Nam.

Students in Fiji had the highest proportion reporting that their parents encouraged them all the time, with more than 25 per cent saying this, in contrast to only 3.8 per cent of students in Viet Nam. About 12.8 per cent to 21.4 per cent of students across the four countries reported that their parents never encouraged them to use the Internet to explore things.

### ***Do siblings encourage students to explore or learn things on the Internet?***

In Bangladesh, siblings seem to play a larger role compared to the role played by siblings in other countries in encouraging students to explore things on the Internet. More than 60 per cent of students from Bangladesh reported that their siblings encouraged them often, very often or all the time. Siblings featured less prominently in Fiji and Viet Nam, with aggregate totals of about 40 per cent and 37 per cent respectively. Korea had the lowest aggregate at 27.7 per cent.

### ***Do peers encourage students to explore or learn things on the Internet?***

Peers featured strongly in Korea as the people who encouraged students to use the Internet to learn things often, very often or all the time, with about 37.8 per cent of students reporting this. Among the four countries investigated, students in Bangladesh were least likely to report that their peers never or hardly ever encouraged them to use the Internet to explore things, with 11.3 per cent of students saying this.

Both Fiji and Korea showed similar trends of 30.7 per cent and 33.7 per cent of students never or hardly ever receiving encouragement from their peers to explore or learn things on the Internet.

### ***How do parents' education levels affect students' digital citizenship competencies?***

In all the domains surveyed, higher parents' education levels were positively associated with higher scores overall. Parents' education levels were one of the few factors that were positively associated with higher competencies across all the domains. This finding is in line with research that shows that higher parents' education levels are associated with higher levels of digital skills and more diverse online activities among children (Sonck et al., 2012) while also being associated with children's higher educational attainment (OECD, 2017).



## What are the domain-specific findings and factors that affect them?

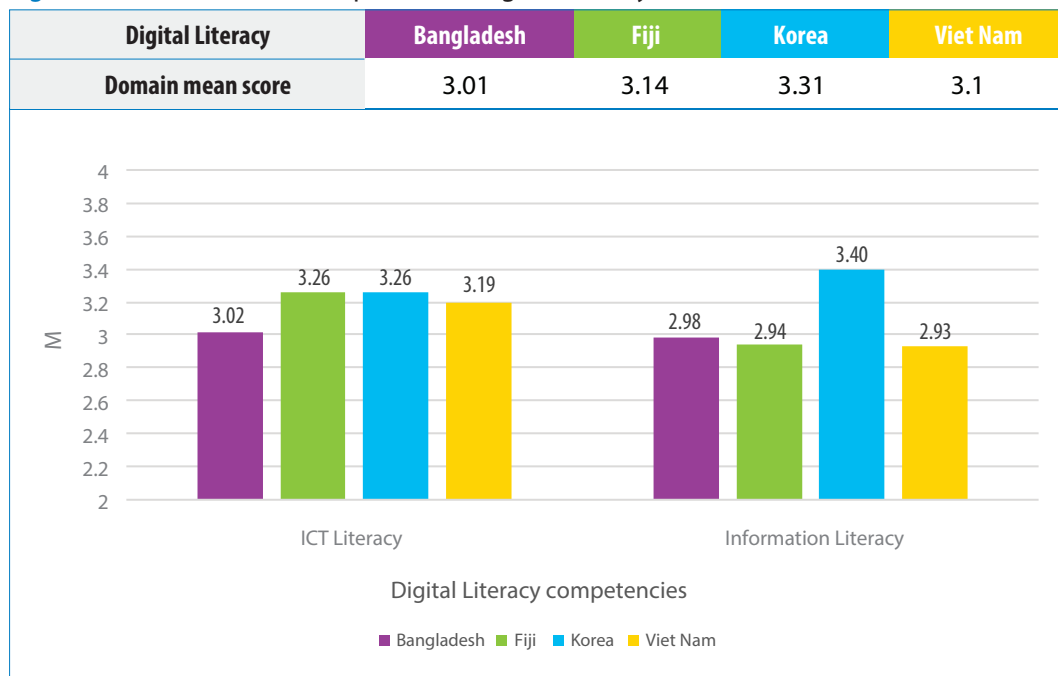
The following section presents analyses of student self-assessments of their DKAP competencies by each domain, and considers whether and how the competencies are associated with the factors that affect students' performance.

### Digital Literacy

Digital Literacy means the ability to seek, critically evaluate, and use digital tools and information effectively to make informed decisions.

Students in Korea had the highest score on average for this domain at 3.31, while students in Fiji had the next highest average score, with 3.14. Students in Viet Nam had an average of 3.10, and students in Bangladesh reported an average of 3.01 (Figure 11). The three factors that had a positive effect on this domain's score were the duration of students' experience with digital devices, the number of digital devices accessible to students at home, and whether students had developed a website or application (app). For full details, see Annex 6.

Figure 11: Cross-national comparison of Digital Literacy.



Digital Literacy consists of two competencies, ICT Literacy and Information Literacy. ICT Literacy means the ability to manage and operate ICT hardware and software responsibly in digital environments, in order to access and search for data, information and content, and to use them

successfully. The mean score for ICT literacy was highest in Korea and Fiji, tied at 3.26, while the figure for Viet Nam was 3.19 and for Bangladesh, 3.02.

Information Literacy means the ability to seek, critically evaluate and use digital information effectively to make informed decisions. The mean score of Information Literacy was highest in Korea at 3.4, while Bangladesh was next highest at 2.98, Fiji was 2.94 and Viet Nam was 2.93.

With the exception of Korea, the countries reported high variability with regard to the questions in the Information Literacy competency. Students in Korea were consistent in reporting agreement with all the questions, with a mean score of 3.40. More than 90 per cent of the students agreed that they could assess the relevance and reliability of information. Almost 96 per cent agreed that they used the Internet to search for information and knew how to report the source of the information. Students in Bangladesh, Fiji and Viet Nam reported a lower level of agreement with the questions regarding their abilities to assess and use information.

With regard to searching the Internet for educational purposes, students across the surveyed countries exhibited high agreement with question A12: "I search for and find information to complete learning tasks on the Internet". About 84 per cent of students in Bangladesh agreed with the question, while 87 per cent of Fiji students, 97 per cent of Korea students, and 96 per cent of students in Viet Nam did so.

Coding is one of the skills that education systems across the Asia-Pacific region are integrating into the curriculum or offering to the wider population as part of national skills development activities. As a result, it was important to gain baseline information on whether students learned coding skills in school, and to what extent those skills connected to the domains and competencies of the DKAP Framework. The highest rate for students learning basic coding skills at school was in Viet Nam at 41.8 per cent, compared to 39.3 per cent of students in Fiji, 33.7 per cent of students in Korea, and 24.8 per cent in Bangladesh.

Whether students learned basic coding in school was associated with a positive effect on the overall scores for Digital Literacy, Digital Participation and Agency, and Digital Creativity and Innovation. At a country level, whether students learned basic coding in school was significant in terms of Digital Creativity and Innovation in Bangladesh, Fiji and Viet Nam, but not Korea (Annex 6).

Connected to students' basic coding skills is the issue of whether students have ever developed websites or applications. Few students had developed websites or applications compared with those who were learning basic coding skills: 28.1 per cent of students in Fiji, 15.1 per cent of students in Korea, and 13.2 per cent of students in Viet Nam had developed websites or applications. In Bangladesh, 26 per cent of students had developed websites or applications, which is similar to the percentage that had learned basic coding skills in school.

Website or application development experience was associated with the largest significant positive effect on the scores for all the domains for students overall when controlling for other factors. At the country level, it also had a significant positive effect on Digital Creativity and Innovation for all four countries. This factor, together with the higher number of hours of digital

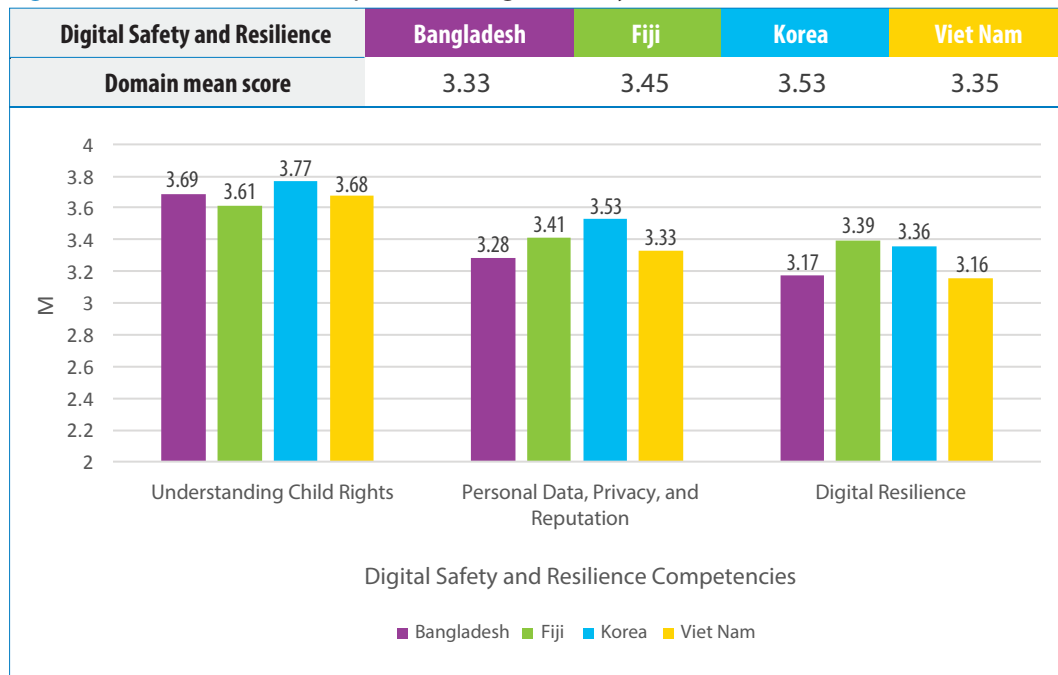
device use per day, were of greatest significance in terms of a positive effect on Digital Creativity and Innovation in all four countries (Annex 6).

### Digital Safety and Resilience

Digital Safety and Resilience means the individual's ability to understand how to protect himself or herself and others from harm in digital space.<sup>2</sup>

Students in Korea had the highest score on average for the Digital Safety and Resilience domain at 3.53, while students in Fiji had the next highest score at 3.45, students in Viet Nam had an average of 3.35 and students in Bangladesh reported an average of 3.33 (Figure 12). Overall, a negative association was found between students' Digital Safety and Resilience score and the amount of time spent using digital devices daily. Students' Digital Safety and Resilience scores were lower the more time they spent using digital devices in a day. The three factors that most positively affected students' scores in Digital Safety and Resilience were longer prior experience in using digital devices, higher numbers of digital devices accessible at home, and higher education levels of both parents.

Figure 12: Cross-national comparison of Digital Safety and Resilience.



2 There are four competencies under this domain in the DKAP Framework: Understanding Child Rights; Personal Data, Privacy and Reputation; Promoting and Protecting Health and Well-being; and Digital Resilience. The survey validation process found that the questions for the Promoting and Protecting Health and Well-being competency did not show that the questions in their current form were statistically reliable, hence the competency is not analyzed in this report.

The competency of Understanding Child Rights relates to students' knowledge of rights and obligations with respect to digital activities within the local and global context. The score of Understanding Child Rights was highest in Korea at 3.77, while in Bangladesh the score was 3.69, in Viet Nam 3.68, and in Fiji 3.61. The mean scores for this competency were higher than for the other two competencies in this domain.

The competency of Personal Data, Privacy and Reputation addresses whether students understand how to use, and when to share, personally identifiable information while being able to protect themselves and others from harm. The mean score for Korea was 3.53, while Fiji was 3.41, Viet Nam was 3.33, and Bangladesh was 3.28.

Differences were observed in students' understanding. Question B5 asked, "I try to avoid threatening other people's personal information when using digital information". For this question, 76.8 per cent of students in Bangladesh agreed and in Fiji, 78.7 per cent of students agreed. The percentages were higher in Korea and Viet Nam with 95.3 per cent and 93.7 per cent, respectively.

For question B7, "I try to protect my personal information from others online", 96.7 per cent of students in Korea agreed, with 94.6 per cent agreeing in Viet Nam, 90.7 per cent in Fiji, and 89.9 per cent in Bangladesh. For Question B8, "I know which information I should and should not share on the Internet", the highest in agreement was Korea at 94.8 per cent, followed by Viet Nam at 94.3 per cent, Fiji at 91.4 per cent, and Bangladesh at 82.0 per cent.

The Digital Resilience competency addresses whether students have the preventative, reactive and transformative skills that allow young people to avoid or cope with the risky situations they face online. The highest score on average by country was Fiji at 3.39, Korea at 3.36, Bangladesh at 3.17, and Viet Nam at 3.16.

### **How do students react when they face risks? Whom do they ask for help?**

In Korea, parents' and caregivers' roles in guiding students regarding ways to use the Internet safely is greater compared to the roles of teachers, siblings and peers (Table 12). About one-quarter of students reported that their parents/caregivers suggested ways to use the Internet safely very often or all the time. This was almost three times the 8.7 per cent figure for teachers, and almost double the 12.3 per cent for siblings and 12.3 per cent for peers. This trend is also seen in Fiji where 35.7 per cent of students reported that their parents/caregivers suggested ways to use the Internet safely very often or all the time, while for teachers the figure was 31 per cent, for siblings 23.5 per cent and for peers 26.9 per cent.

In Viet Nam, a different trend was observed, with students receiving more suggestions on ways to use the Internet safely from peers and siblings, while parents/caregivers were much less involved and teachers least of all. While 14.8 per cent of Vietnamese students said they received suggestions on ways to use the Internet safely very often or all the time from their peers, and 12.1 per cent said they received this support from their siblings, only 9 per cent said that parents/caregivers helped in this way, with 4.7 per cent gaining assistance from their teachers.

**Table 12:** Frequency at which students are guided to use the Internet safely, by country and type of stakeholder.

	Never	Hardly ever	Some-times	Often	Very often	All the time
<b>Parents/caregivers</b>						
Bangladesh	14.4	5.0	24.1	23.7	8.3	24.5
Fiji	11.4	8.9	36.9	7.1	6.8	28.9
Korea	12.1	11.1	27.5	24.7	10.5	14.2
Viet Nam	21.8	26.8	29.2	13.2	2.5	6.5
<b>Teachers</b>						
Bangladesh	4.8	4.5	25.1	31.6	14.5	19.5
Fiji	17.7	15.4	24.8	11.0	10.1	20.9
Korea	27.1	24.7	27.6	12.0	3.2	5.5
Viet Nam	14.4	23.2	39.5	18.2	2.5	2.2
<b>Siblings</b>						
Bangladesh	13.4	6.0	22.6	26.0	17.2	14.8
Fiji	19.0	15.3	29.4	12.9	9.2	14.3
Korea	35.7	18.8	19.4	13.8	5.1	7.2
Viet Nam	15.1	15.2	33.7	23.9	7.5	4.6
<b>Peers</b>						
Bangladesh	9.6	6.6	26.6	24.5	17.3	15.4
Fiji	19.9	15.4	26.0	11.8	9.2	17.7
Korea	26.7	20.2	24.6	16.3	5.6	6.7
Viet Nam	11.2	19.7	31.9	22.4	9.2	5.6

In contrast to Korea, Fiji and Viet Nam, students in Bangladesh frequently received information on how to use the Internet safely in a more balanced manner from a variety of people in their lives; 32.8 per cent of students reported that their parents/caregivers suggested ways to use the Internet safely very often or all the time, while for teachers the figure was 34 per cent, for siblings 32 per cent, and for peers 32.7 per cent.

In Korea, about 50 per cent of students reported that they never or hardly ever received suggestions on ways to use the Internet safely from their teachers, siblings or peers. Teachers also seemed to play a lesser role in suggesting ways to use the Internet safely in both Fiji and Viet Nam, with 33.1 per cent of students in Fiji and 37.6 per cent of students in Viet Nam reporting that their teachers never or hardly ever talked about this.

Compared to Fiji, Korea and Viet Nam, Bangladesh teachers seemed to be the major source of Internet safety information in students' lives, with only 9.3 per cent of students in Bangladesh reporting that their teachers never or hardly ever suggested ways to use the Internet safely.

## How do students react to negative experiences online?

The domain of Digital Safety and Resilience includes self-reports of students' behaviours in certain situations. Unlike the rest of the questionnaire which measured students' knowledge and attitudes toward digital technologies, the four behaviour-related questions in this domain measured how students think they ought to behave in specific situations. Students could choose one or multiple options in answering the questions.

Question B15 asked "how will you react when you are exposed to unwanted disturbing files or websites (e.g., pornography website, violent media)?" The action that was most frequently selected was to get rid of it immediately by closing the page, deleting the file, or scrolling away. On average across all the countries, 79.6 per cent of students chose that action. At the country-level, almost 87.1 per cent of Vietnamese students, 81.4 per cent of Korean students, 77.6 per cent of Bangladesh students, and 72.3 per cent of Fiji students chose this option (Table 13).

**Table 13:** Answers to question B15: "How will you react when you are exposed to unwanted disturbing file or website (e.g., pornography website, violent media)?"

	Bangladesh	Fiji	Korea	Viet Nam	Total
① Get rid of it immediately by closing the page, deleting the file, or scrolling away	77.6	72.3	81.4	87.1	79.6
② Talk about it with parents/ caregivers	38.0	37.5	7.1	14.6	22.4
③ Use a programme that prevents it from happening again	49.1	45.5	29.8	61.1	44.0
④ Talk about it with a friend	48.8	26.6	7.8	9.9	21.3
⑤ Look away or close my eyes	15.4	15.7	12.8	6.9	12.8
⑥ Keep looking	5.1	5.8	10.7	2.5	6.7
⑦ Block the webpage or website	61.9	68.5	49.7	74.5	61.9
⑧ Don't know what to do	7.0	7.3	6.2	1.7	5.7

Significant percentages of students in all four countries also reported that they would block the webpage or website as one of the options in response to the situation. The percentages ranged from 49.7 per cent in Korea to 61.9 per cent in Bangladesh to 68.5 per cent in Fiji and 74.5 per cent in Viet Nam.

About 38 per cent of students from Bangladesh and Fiji chose to talk about the issue with parents, caregivers, but only 7 per cent of students in Korea and 15 per cent of students in Viet Nam chose the same course of action.

Question B16 asked, “How will you react when you receive unwanted disturbing messages including annoying messages or embarrassing pictures from someone on your contact list?” On average, across all the countries, the most frequently chosen action by 74.5 per cent of students was that they would block and report the person. At the country level, 84.4 per cent of Korean students, 79.7 per cent of Vietnamese students, 69.4 per cent of Fiji students, and 58.6 per cent of Bangladesh students answered they would block and report the person (Table 14).

**Table 14: Answers to question B16: “How will you react when you receive unwanted disturbing messages including annoying messages or embarrassing pictures from someone on your contact list?”**

	Bangladesh	Fiji	Korea	Viet Nam	Total
① Block and report the person	58.6	69.4	84.4	79.7	<b>74.5</b>
② Delete the contact	59.1	62.6	47.4	55.2	<b>55.1</b>
③ Ignore the messages and the person	50.0	38.4	46.8	17.5	<b>39.4</b>
④ Talk with parents/ caregivers about what to do	39.3	33.9	11.7	22.3	<b>24.9</b>
⑤ Ask the person to stop sending these messages or pictures	78.3	57.5	24.8	64.8	<b>52.0</b>
⑥ Talk with teachers about what to do	18.6	15.4	3.5	7.2	<b>10.3</b>
⑦ Report the issue to the police and show them what happened	11.5	41.8	27.4	20.2	<b>26.1</b>
⑧ Don't know what to do	3.2	4.0	3.4	0.4	<b>2.9</b>

The second option most frequently chosen by students was to “delete the contact”. There were wide variations among the countries in the less frequently chosen options. Very few students across all the countries (10.3 per cent) chose the option of talking with teachers about what to do. Only 3.5 per cent of students in Korea would choose to talk to their teachers, while 7.2 per cent of students in Viet Nam, 15.4 per cent of students in Fiji, and 18.6 per cent of students in Bangladesh would choose the same.

With regard to talking to parents and caregivers about what to do, a similar pattern emerged where Korean students were the least willing to choose that option at 11.7 per cent, while 22.3 per cent of Viet Nam students were willing to do so, and 33.9 per cent of Fiji students and 39.3 per cent of students in Bangladesh were willing to do so.

Reporting the issue to the police and showing them what happened was an option selected by only 11.5 per cent of students in Bangladesh, about half of the 20.2 per cent of students who would take that option in Viet Nam. Students in Fiji and Korea were more willing to report the issue to the police, with 41.8 per cent and 27.4 per cent choosing that option respectively.

The option to ask the person to stop sending the messages or pictures featured in almost three-quarters of Bangladesh students, compared to only 24.8 per cent in Korea.

Question B17 asked, "How will you react when you find that your personal information is misused, compromised or acquired without permission online?"

The option most frequently chosen by students was to change their password. On average, across countries, 76.4 per cent of students reported that they would change their password. The second most frequently chosen option was to review privacy settings and choose a more secure password, which was chosen by 68.3 per cent of students on average. More than double the percentage of students in Korea (55.9 per cent) and Viet Nam (50.6 per cent) chose to use a report button compared with students in Bangladesh (24.0 per cent) and Fiji (23.9 per cent) (Table 15).

**Table 15: Answers to question B17: "How will you react when you find that your personal information is misused, compromised or acquired without permission online?"**

	Bangladesh	Fiji	Korea	Viet Nam	Total
① Change password	80.8	77.7	75.8	71.5	76.4
② Review privacy settings and choose a more secure password	75.1	52.8	64.9	85.2	68.3
③ Use a report button	24.0	23.9	55.9	50.6	40.5
④ Disable or delete the account and make a new account	38.6	60.8	43.8	33.2	44.6
⑤ Ask parents/caregivers to help	32.7	28.9	13.7	14.8	21.5
⑥ Ask teachers to help	17.8	15.5	4.3	5.7	10.1
⑦ Report the issue to the police and show them what happened	11.9	28.8	30.2	24.3	24.9
⑧ Don't know what to do	5.8	5.0	3.2	1.6	3.8

Similar to question B16, students chose to ask parents and caregivers over teachers. Overall, an average of only 21.5 per cent of students chose to ask parents and caregivers to help and only 10.1 per cent of students chose to ask teachers to help. Bangladesh reported a higher rate



of help-seeking: 32.7 per cent of students chose the option to ask parents or caregivers to help, and 17.8 per cent chose the option to ask teachers to help.

Question B18 asked, "How will you react when you are bullied online by friends or others?"

On average across all the countries, students most frequently chose the option to "block and report the persons," with 65.2 per cent of students choosing this option. Students in Bangladesh, Fiji and Viet Nam were more willing than students in Korea to ask the people who were bullying them to stop sending annoying messages or pictures. Only 26.8 per cent of students in Korea chose that option, compared to 67.5 per cent in Bangladesh, 49.7 per cent in Fiji and 51.0 per cent in Viet Nam. This may reflect the training that Korean students receive at school in terms of responding to cyberbullying incidents. For instance, they may be taught to avoid confrontation, gather evidence (e.g., screen shots), and immediately report the cyberbullying to authorities such as schools or police (Table 16).

**Table 16: Answers to question B18: "How will you react when you are bullied online by friends or others?"**

	Bangladesh	Fiji	Korea	Viet Nam	Total
① Block and report the persons	60.5	66.0	66.1	67.2	65.2
② Delete the contact	59.2	55.4	29.7	42.6	44.6
③ Show the persons I am not bothered by their behaviour by ignoring them	58.8	46.2	29.9	30.6	40.0
④ Talk with parents/caregivers about what to do	37.7	31.1	24.8	29.6	30.0
⑤ Ask the persons to stop sending annoying messages or pictures	67.5	49.7	26.8	51.0	45.7
⑥ Talk with teachers about what to do	17.7	15.9	15.7	13.3	15.7
⑦ Report the issue to the police and show them what happened	13.2	33.7	47.2	19.2	31.1
⑧ Keep the evidence of bullying (e.g., screen shot)	39.3	44.7	69.9	66.9	56.8
⑨ Don't know what to do	5.7	3.9	2.6	1.3	3.3

Similar to the responses to previous questions, talking to parents, caregivers and teachers about what to do were among the options least chosen by students. On average, only 30 per cent of

students across all four countries would speak to their parents and caregivers about what to do, and only 15.7 per cent would speak with teachers about what to do.

More students in Bangladesh and Fiji chose to ignore the bullying behaviour, to show that they were not bothered by the bullying, with 58.8 per cent in Bangladesh and 46.2 per cent in Fiji choosing that option. In contrast, only 29.9 per cent of students in Korea and 30.6 per cent of students in Viet Nam chose that option.

With regard to approaching authorities for help, students in Korea chose to report to police more frequently than in the other countries, with 47.2 per cent of students choosing that course of action, while 33.7 per cent of students in Fiji, 19.2 per cent of students in Viet Nam and 13.2 per cent of students in Bangladesh chose to approach police. Such differences might be attributed to Korea's national-level responses to the increasing school violence, including cyberbullying. These responses include the 117 Hot Line and mobile app for School Violence that is directly connected to metropolitan and provincial police agencies since 2012 (Korea National Police Agency, 2018).

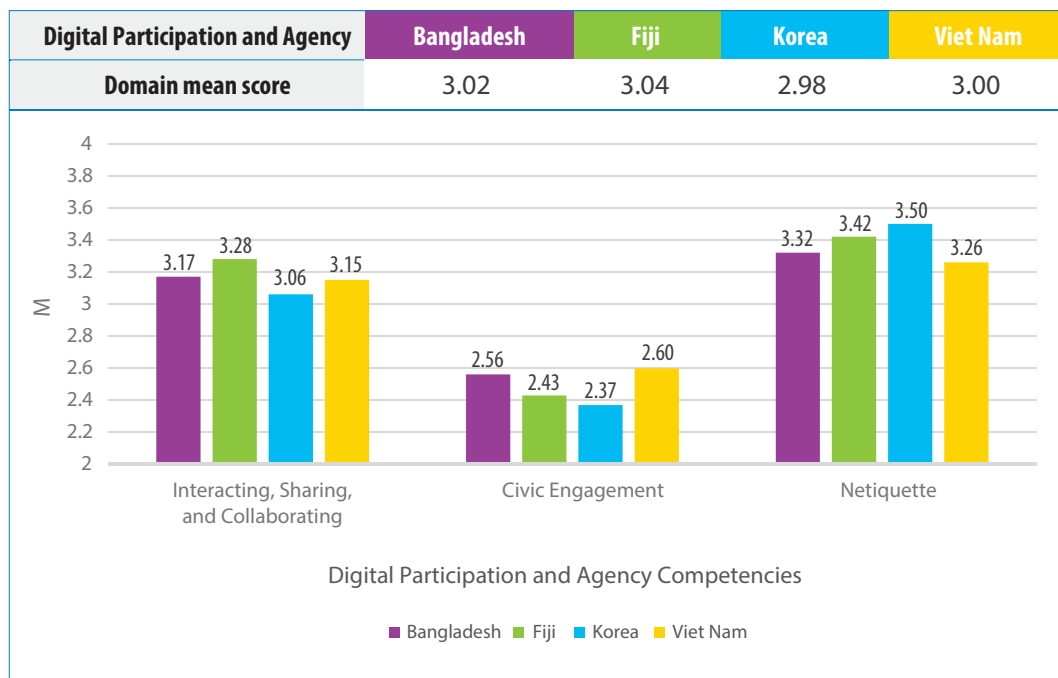
While 69.9 per cent of students in Korea, and 66.9 per cent of students in Viet Nam, chose to "keep the evidence of bullying (e.g., screenshot)", only 39.3 per cent of students in Bangladesh and 44.7 per cent of students in Fiji adopted this strategy.

## Digital Participation and Agency

Digital Participation and Agency means the ability to equitably interact, engage and positively influence society through ICT use.

Students in Fiji had the highest score on average for this domain at 3.04, while students in Bangladesh had the next highest score at 3.02. Students in Viet Nam had an average of 3.00 and students in Korea reported an average of 2.98 (Figure 13.) The scores are remarkably similar across the countries. The factors that most positively correlated with students' scores in Digital Participation and Agency were having previously developed a website or application, longer prior experience with using digital devices, and higher numbers of digital devices accessible at school.

Figure 13: Cross-national comparison of Digital Participation and Agency.



The Digital Participation and Agency domain consists of three competencies. The competency of Interacting, Sharing and Collaborating relates to whether students interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals. Students from Fiji had the highest score at 3.28, with Bangladesh students next highest at 3.17. Viet Nam averaged 3.15 while Korea had the lowest score of 3.06.

The competency of Civic Engagement is related to students' ability and willingness to act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use. The mean score for Civic Engagement was highest in Viet Nam at 2.60. Bangladesh had an average of 2.56, Fiji was 2.43, and Korea was the lowest with

2.37. Civic Engagement scores on average were the lowest among the three competencies of the Digital Participation and Agency domain.

Despite the longer experience with digital devices in Korea, students participated less in online civic engagement than students in other countries. Question C5 asked for responses to “I post news on social issues online (e.g. Facebook, Instagram, blog)”. About 34 per cent of students in Korea agreed that they did. In Bangladesh, 52.3 per cent of students agreed, 62.0 per cent agreed in Fiji, and 67.0 per cent agreed in Viet Nam. Similar patterns were observed in questions C6 and C7 which asked about how students used the Internet to create solutions for their schools, towns, or communities.

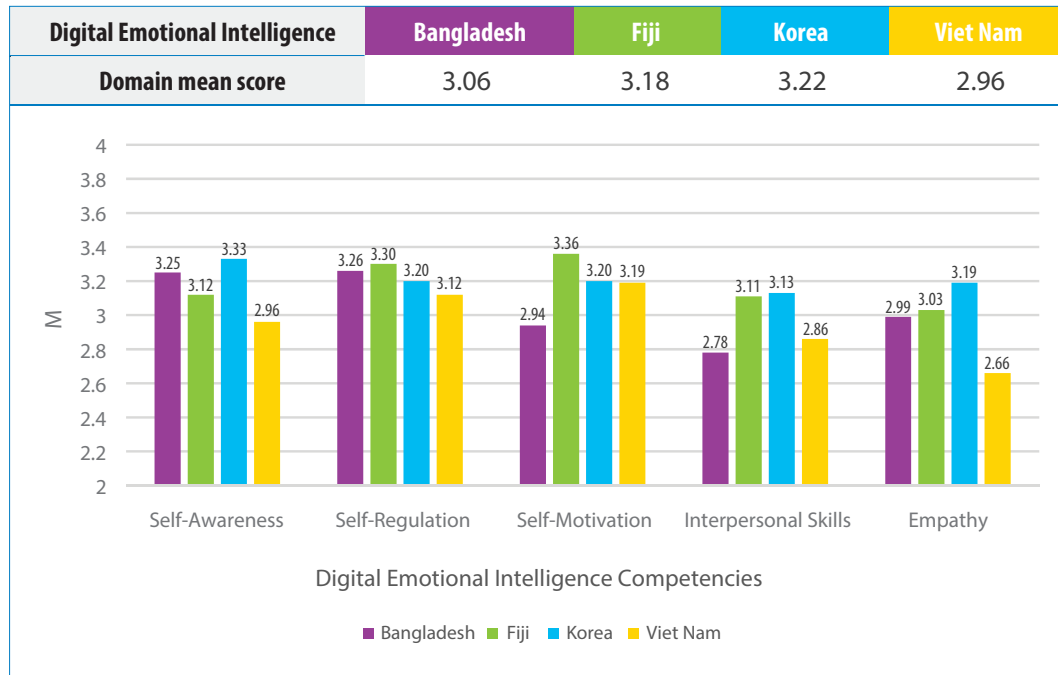
The competency of Netiquette relates to students’ ethical and courteous behaviour that informs their choices when interacting and engaging in different digital environments with different individuals and audiences. In contrast to the other competencies in this domain, Korea had the highest average score of 3.50, Fiji had an average score of 3.42, Bangladesh had an average of 3.32, and Viet Nam was the lowest score of 3.26.

## Digital Emotional Intelligence

Digital Emotional Intelligence focuses on the ability to recognize, navigate and express emotions in one's digital intrapersonal and interpersonal interactions. Children's interactions with ICT have changed in various ways as online activity has become more pervasive and as children are increasingly socialized in part via their online activities (Genner and Süss, 2017). These factors may influence young people's behaviours, and their use of ICTs in networked digital spaces. This area has attracted limited research in the Asia-Pacific region, and rarely features in educational or policy material as a significant consideration.

Students in Korea had the highest score on average for this domain at 3.22, while students in Fiji had the next highest score of 3.18, with students in Bangladesh having an average of 3.06 and students in Viet Nam reporting an average of 2.96 (Figure 14).

Figure 14: Cross-national comparison of Digital Emotional Intelligence.



The Digital Emotional Intelligence domain consists of five competencies. The competency of Self-Awareness relates to the students' ability to explain their moods, emotions, drives, and how these affect him or herself and others in the digital world, through introspection. Students in Korea reported the highest average score of 3.33, students in Bangladesh were the next highest at 3.25, students in Fiji had an average of 3.12, and students in Viet Nam had a score of 2.96.

While students in Fiji reported strong self-awareness in their use of digital devices and how they expressed themselves, they were less comfortable with expressing their feelings freely. Over 80 per cent of Fijian students indicated that they were aware of their feelings in online experiences

and the same percentage agreed that they could express themselves in ways that made a good impression. However, approximately only 51 per cent indicated they could “express my feelings freely on the Internet using online communications”.

The competency of Self-Regulation relates to students’ ability to manage their emotions, moods and impulses during online engagements. Students in Fiji showed the highest self-regulation score (3.30), followed by Bangladesh (3.26), Korea (3.20) and Viet Nam (3.12). The average scores across all the countries for Self-Regulation were relatively high compared to the other four competencies in Digital Emotional Intelligence.

The competency of Self-Motivation relates to students’ ability to demonstrate initiative, and a commitment to attaining internal or external goals, despite setbacks, in the digital sphere. Students in Fiji showed the highest self-motivation score (3.36), with Korea (3.20), Viet Nam (3.19) and Bangladesh (2.94).

Competency in Interpersonal Skills relates to students’ ability to build positive online relationships: to communicate, build rapport and trust, embrace diversity, manage conflicts, and make sound decisions. Students in Korea had the highest average score of 3.13 in the interpersonal skills in digital spaces, with Fijian students closely following (3.11). Students in Viet Nam (2.86) and Bangladesh (2.78) showed relatively lower competencies in building positive online relationships.

Lastly, the competency of Empathy relates to students’ ability to demonstrate awareness and compassion for the feelings, needs and concerns of others during digital interactions. Students in Korea had the highest empathy score of 3.19, followed by Fiji (3.03), Bangladesh (2.99) and Viet Nam (2.66).

Students in all four countries showed the lowest competencies in Empathy and Interpersonal Skills in this domain, relative to the other competencies in the domain.

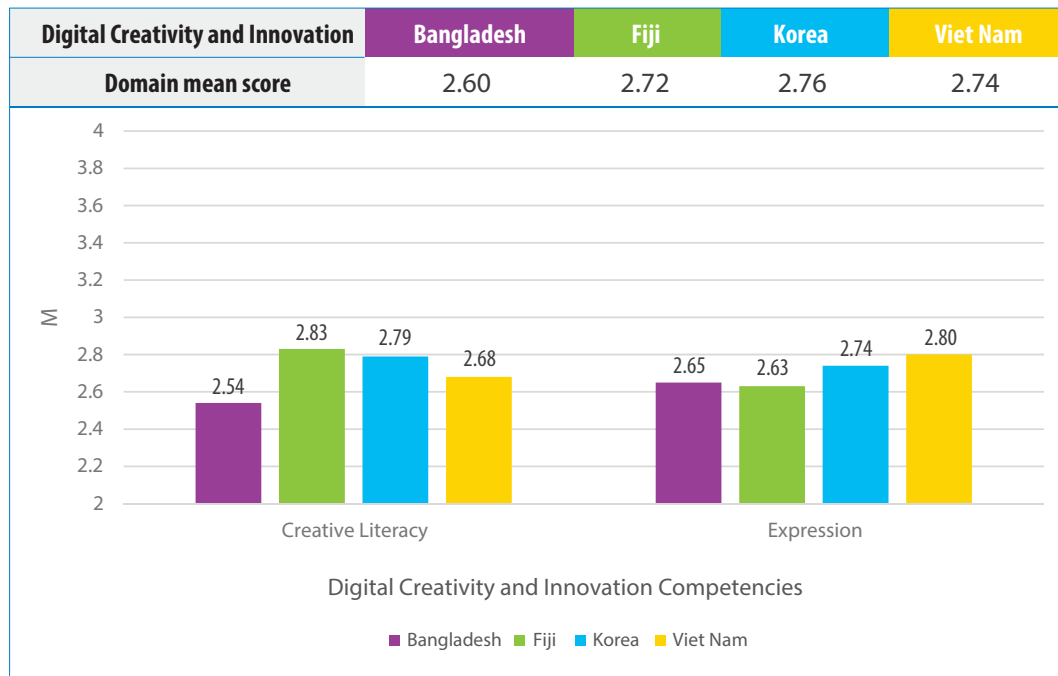
## Digital Creativity and Innovation

Digital Creativity and Innovation means the individual's ability to express and explore herself or himself through creation of content using ICT tools.

As mentioned earlier, this domain had the lowest mean scores compared to the other four domains, and the trend was found across all four countries. This finding supports the "ladder of opportunity" model (Livingstone, Haddon, and Görzig, 2012) which suggests that most students tend to engage in basic digital activities, while fewer of them progressively reach the advanced level where they are competent and motivated enough to create digital artifacts.

Students in Korea had the highest average score of 2.76, while students in Viet Nam had a score of 2.74, students in Fiji had a score of 2.72, and Bangladesh had a score of 2.60 (Figure 15).

**Figure 15: Cross-national comparison of Digital Creativity and Innovation.**



Digital Creativity and Innovation consists of two competencies. The competency of Creative Literacy relates to students' ability to apply skills and use tools to create, adopt, or curate digital content. The highest score for Creative Literacy was seen in Fiji with 2.83, followed by Korea with 2.79, Viet Nam 2.68, and Bangladesh 2.54. Responses to Question E3 which asked "I create presentation slides to support my ideas or opinions", showed students' familiarity with developing presentations, except in Bangladesh. In Fiji, 72.9 per cent of students agreed, 80.0 per cent agreed in South Korea, and 77.1 per cent agreed in Viet Nam. In Bangladesh, 45.7 per cent of students agreed. This may be correlated with Bangladesh's lower score in Digital Literacy and student's lack of exposure to digital devices.

The competency of Expression relates to students' ability to use technology to creatively represent their identities and to exercise their right to fun and relaxation. The highest score for Expression was seen in Viet Nam with 2.80, followed by Korea with 2.74, Bangladesh with 2.65, and Fiji with 2.64.

In sum, the findings across the five domains suggest notable similarities across the countries, while revealing each country's own strengths and weaknesses. One common pattern is that students from all countries had the highest performance in Digital Safety and Resilience, while they showed much lower competencies in Digital Participation and Agency, and Digital Creativity and Innovation. These findings suggest a need for a paradigm shift in digital citizenship education. While it is still important to safeguard and protect children from any harms in the digital world, education policy and interventions should make an intentional effort to provide a conducive environment for children to develop their agency and creativity. Children should be empowered to create and express themselves and also be supported in their active participation and influence in local and global communities through digital technologies. More detailed policy implications from the findings are presented in Chapter 6, Policy Recommendations.





# 5

## Limitation and challenges

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As the first research in Asia-Pacific region of its kind measuring children's digital citizenship competencies at a cross-country national level, there are several limitations to be acknowledged, especially for those who wish to replicate the research in their own context.

### Limitation in research methodologies

First, the sample size of each country may not necessarily represent the entire population of the age group. The sampling process and sample size were carefully designed and standardized across the four countries in order to reduce the risk of standard errors. Nevertheless, a minimum number of 1,000 students from 20 schools through stratification methods such as school and/or regional types is, in some of the countries, not close to a scientific representation of the total population. Thus, caution should be used in generalizing the findings. Furthermore, some students, such as those with intellectual disabilities or non-native language speakers, were excluded in order to achieve the validation purpose of the survey tool. In addition, as noted by the Bangladesh research team, the sample of 1,054 students from schools in rural and urban areas was not large enough to cover the diverse geographical characteristics and student populations of 15-year-old students in Bangladesh (See Annex 9).

Second, the competencies were measured through student self-reporting using a four-point Likert scale. Acknowledging that measuring actual skills and attitudes by assessment and observation is extremely difficult and resource-heavy, the project team intentionally chose the self-reporting Likert scale in order for any country, even with low capacity and scarce resources, to be able to afford to replicate the research. Nevertheless, the limitation of a self-reporting survey method should not be neglected – it may distort and inhibit students' responses as it relies upon student awareness and recall. Instead of reporting truthful responses, students may respond in what they perceive to be a socially desirable way in order to conform to socially

acceptable values, avoid criticism, or gain social approval (King and Bruner, 2000). Due to this social desirability response bias, the level of ICT-related competency of each country may be under-estimated or over-estimated.

Third, because of the inherent limitations of the self-reporting method, the project team faced a low internal consistency in some of the domains. For example, the domain of Digital Safety and Resilience had a relatively low level of internal consistency (Cronbach's  $\alpha = 0.687$ ). A possible reason for this is related to one competency under this domain, namely, Promoting and Protecting Health and Well-Being (Cronbach's  $\alpha = -0.017$ ). Cronbach's alpha of items measuring the Promoting and Protecting Health and Well-Being competency (B9 – B11) under the Digital Safety and Resilience domain was extremely low and negative across all four countries. This indicates that these competencies are not internally consistent and should either be replaced with other items or removed when further research is undertaken.

Lastly, we would like to emphasize that the data from this survey tool does not provide a basis for direct causal-effect inferences, for example, which factor causes higher or lower levels of digital citizenship competencies. We recognize that there are many factors that may affect the measurement of the complex concepts encompassed by digital citizenship, and not all of them have been captured in this survey. Even so, the research has highlighted some interesting associations between factors that we hope will provide a basis for future research.

## Challenges

Despite regular meetings and close collaboration with a standardized research manual, the countries faced a number of challenges in different phases of the project, ranging from preparation, translation, training, parental consent, school support and coordination. The challenges reported by countries varied. The summary of challenges faced by countries is presented in Annex 9.

One of the recurring challenges across the four countries was that of translation. For example, despite the close support of the project team and of local experts for the translation and back-translation of survey items in Viet Nam, issues around internal consistency persisted and internal consistency of items was relatively lower than those of the other three countries. The results may be explained by the use of region-specific words or phrases that influenced Vietnamese respondents' interpretations or responses, but the disparity remained challenging.

The support from school leadership as well as governments (Ministries of Education) was unanimously identified as success factors in achieving the desired outcome of the project in all countries (e.g. data collection).



# 6

## Policy recommendations

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One of the goals of this research is to provide data-informed policy directions for governments and other key stakeholders who intend to develop and implement digital citizenship education policies and programmes. This section presents seven key policy recommendations drawn on the findings of the study.

### **Develop a holistic concept of digital citizenship that goes beyond digital skills and safety**

The DKAP Framework was developed with a view to fostering a holistic digital citizenship education. The results from the 5,129 children surveyed show that their competencies across the five domains of the framework are not evenly developed. The gaps between the highest scored domain (Digital Safety and Resilience) and the lowest (Digital Creativity and Innovation) are notable. The gaps imply that the current education system and policy settings may overly focus on children's safety and protection in digital spaces, with less attention paid to support children in developing digital creativity and innovation. An independent policy review by UNESCO in 2015 found that 10 out of the 12 countries reviewed in the Asia-Pacific region responded that they had safety and protection elements in their education policy (UNESCO, 2015). Given the changing landscape of the workforce and society, there should be an equal emphasis on creativity and innovation.

Digital citizenship is more than being able to use ICT in a safe way. It is about preparing children to become true digital citizens, with both the skills and the socio-emotional abilities to engage with digital technologies and other users in a critical and ethical manner while being aware of their own and others' rights and responsibilities. Achieving a multifaceted vision for digital citizenship requires a balancing of education programmes and policy settings. The five-domain DKAP Framework offers governments, organizations and civic society a comprehensive lens to

examine digital citizenship and well-grounded principles to help design educational policies and intervention programmes.

## **Encourage research on children that reflects their voices in policy development**

This study shows that the findings in each country are unique, nuanced and particular to each. Therefore, an intervention to help students develop digital citizenship competencies that worked well in country A would not necessarily be effective in country B. This perspective underlines the importance of evidence-based policy development, reflecting children's unique strengths, needs and progress. Governments require periodic research on changes in children's digital behaviour, perceptions, and attitudes in order to plan, develop, implement and monitor large-scale educational interventions.

Research enables children's voices to be heard in policy development and it is no exaggeration to say that the national education policy determines the future of children in a country. Listening to and reflecting children's voices in both education policy and in the development of interventions allows them to be a part of planning for their future. This is an overarching principle of the DKAP, i.e. a rights-based approach to digital citizenship, guided by the UN Convention on the Rights of the Child.

The findings of the DKAP study have already been of significant interest to the governments of some of the participating countries, leading to plans to take concrete actions in response. The Ministry of Education and Training of Viet Nam has indicated that it is planning to incorporate the DKAP findings into its national curriculum reform process, while strengthening the capacity of textbook and curriculum developers to integrate elements that support the DKAP Framework competencies into forthcoming textbooks. The Department of Secondary and Higher Education of Bangladesh has also indicated that it is planning to integrate the DKAP Framework with ICT in Education policies and curriculum development. The prominent role played by teachers in supporting students' digital capabilities in Bangladesh is further recognized by plans to align teacher competency standards with the DKAP Framework and train teachers on the updated curriculum. The Ministry of Education, Heritage and Arts in Fiji has suggested plans to develop a Digital Use Policy for schools as a result of the DKAP findings and has indicated that it will conduct discussions with its curriculum section to explore opportunities for incorporating elements of the DKAP Framework competencies.

Based on different patterns of digital competencies observed in the study, we recommend that the DKAP survey be used as an assessment tool for countries that seek better understanding of their students' digital citizenship competencies and that the results of analysis be used as empirical data to guide the policy-making process and also for advocacy of children's needs. Replication of the DKAP survey should be carried out bearing in mind the limitations of the research methodology and contextualized to a country's political, social, and cultural context where appropriate. The survey can also be modified to suit the country's interests and priorities.

## **Build student support systems with parents, teachers, peers, and siblings**

The findings are unequivocal about the fact that students learn, seek help and receive advice from a variety of people in their lives regarding using digital devices, going online, and dealing with risks. From whom the students learn, seek help and receive advice differs significantly from country to country. Even in Korea, where more than half of the students said they learned about computers and the Internet by themselves, almost 40 per cent also learned from teachers, friends and family. This proportion increases to more than 70 per cent in Bangladesh. Similar trends in terms of national differences are seen for the people who encourage students to explore or learn things on the Internet as well as providing suggestions on how to use the Internet safely.

Stakeholders in the education system, including Ministries of Education, non-governmental organizations, and implementation providers, could therefore reconsider their assumptions about students' main sources of digital information and knowledge. Since assumptions about these matters underpin most interventions carried out by stakeholders, it is important to ensure that policy initiatives are based on how students are actually behaving. Parents, teachers, peers and siblings are significant actors in helping students' construction of knowledge about digital citizenship. The support provided by teachers, who play a significant role in assisting students' digital skill development in Bangladesh and to a lesser extent in the other countries, remains prominent in these findings. It is critical that teachers continue to be supported in their professional development and training in relation to a broad range of digital citizenship competencies, particularly in the case of Digital Creativity and Innovation. In sum, education stakeholders should develop information dissemination and training activities that target all the diverse actors, who are also likely to have different needs and abilities themselves, to build an ecosystem of multiplayer support.

In addition, building upon the need to hear children's voices in research and education policy, the strong role that peers play in helping each other learn about things on the Internet, and using the Internet safely, could be the basis for youth-led interventions that support students' digital citizenship development.

## **Embrace positive sides of screen time, but with caution**

One of the most notable findings is the relationship between children's exposure to digital devices and their levels of digital citizenship competencies. The data tells us that a longer period of screen time per day may be a factor in developing certain competencies. For example, higher frequency of use (hours per day) was positively associated with Digital Literacy, Digital Participation and Agency, and Digital Creativity and Innovation, while it was negatively associated with Digital Safety and Resilience. Further analysis should be conducted to illuminate the effects of screen time on the development of these competencies.

In no sense does this mean that children's screen time should be of no concern. Nearly a quarter of the respondent children in Korea and Viet Nam said they spent more than 5 hours a day on digital devices, and more than half of this number spent more than 7 hours a day in this way. Considering that secondary school children spend about 8 hours per day in school, and sleep for 8 hours, this result provides an insight into the intensity of children's ICT use. It also connects with research that has found that "[s]tudents who spend more than 6 hours online per weekday outside of school were more likely to report that they were not satisfied with their life or feel lonely in school" (OECD, 2017, p. 220).

The main message therefore should not simply be one of longer or shorter use or not use, but instead to guide children to use digital devices in ways that support digital citizenship. Children should be encouraged to spend their time in a balanced manner that includes healthy physical and social activities.

## **Make a coordinated effort to close the digital divides**

The DKAP study demonstrates severe digital divides between and within the participating countries. These divides have a significant effect upon children's competency levels across almost all the domains of digital citizenship.

For instance, more than 40 per cent and 32 per cent of the students in Bangladesh and Fiji respectively had never used digital devices prior to the previous year, while this was true of only 3 per cent and 7 per cent of students in Korea and Viet Nam, respectively. In other words, a significant proportion of the Bangladesh student participants did not have experience with digital devices until they were 14 years old, whereas 81 per cent of Korean students had already been exposed to digital devices by the time they were aged 10 (Figure 7).

The findings suggest that children who are exposed to digital devices earlier develop higher competencies in Digital Literacy, Digital Safety and Resilience, Digital Emotional Intelligence and Digital Creativity and Innovation. This supports findings from the 2013 International Computer and Information Literacy Study that one additional year of computer experience contributes to a nine-point increase in digital literacy, and that this factor is stronger for less developed countries (Fraillon et al., 2014).

The digital divide is also evident in comparisons between children from urban and rural areas, as being from an urban location has a significantly positive effect on Digital Safety and Resilience overall (Annex 8).

This finding supports one of the principles that guides the DKAP Framework: Equity in quality access to ICT. It is therefore strongly recommended that governments coordinate the efforts of multi-stakeholders in providing inclusive access to ICT through multiple access points such as schools, libraries, and local community centres.

## Empower girls and focus on their talents

The findings show a positive picture that goes against a conventional understanding of the gender gap: girls in general have more digital citizenship competencies than do boys, outperforming boys in all five domains. In contrast to the holistic talents demonstrated by this study, females are often underrepresented in science, technology, engineering and mathematics (STEM) areas, accounting for only 15 per cent and 18 per cent of the STEM workforce in Japan and Korea, respectively (UNESCO, 2015). Further, women who join the STEM fields face additional challenges both within the places of employment (e.g. lack of female mentors, male-dominated culture) and/or from societal expectations (e.g. taking care of family and children), resulting in a higher tendency for women to leave the sector than is the case for their male counterparts (ILO, 2019).

Considering the multi-faceted and well-balanced talents displayed by girls in this study, STEM industry and governments might look into gender-sensitive opportunities and gender-responsive programmes to fully utilize the holistic contribution that women can make to the digital workforce, preventing these skills and competencies from being wasted.

Conversely, boys may benefit from targeted support and interventions related to Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence and Digital Creativity and Innovation.

## Develop inter-sectoral partnerships to address identified challenges

The above-mentioned challenges are associated with so many factors that they cannot be fully addressed without effective partnerships among different sectors and stakeholders. For example, addressing the lack of access to Internet and digital devices in rural schools may require inter-sectoral collaboration between ministries of education, the information technology industry, telecom providers, and ministries of ICT and infrastructure. In countries where UNESCO has supported the development of an ICT in Education Master Plan, inter-sectoral discussions were initiated by involving these key stakeholders in policy development meetings and workshops. In addition, researchers play a pivotal role in assessments of children's digital citizenship competencies and informing the development of sound evidence-driven interventions that involve multi-sectoral players in helping to foster digital citizenship.

The DKAP Framework emphasizes diverse aspects of digital citizenship competencies, and designing and implementing the necessary policy and education programmes will require cross-sector cooperation. For instance, Digital Safety and Resilience may need cooperation from the IT industry and ministries of ICT, as exemplified by ITU's Child Online Protection Initiative launched in 2008. The initiative brings together partners from all sectors of the global community, including UNICEF, to create a safe and empowering online experience for children. The Guidelines for Child Online Protection were developed under the initiative to establish the necessary foundation for a safe and secure environment. The guidelines are meant to be

adapted and adopted by all different stakeholders groups. To date, four sets of guidelines have been developed for (1) children, (2) parents, guardians, and educators, (3) industry, and (4) policy-makers. Digital Creativity and Innovation may require a whole-of-school approach where students' failures are encouraged and supported, since these are an integral part of growth and experimentation helps build creativity. Digital Participation and Agency can be fostered through allowing children to work together at school, encouraging wide participation and supporting youth-led initiatives. Parents also have an important role to play in promoting students' digital citizenship by creating home environments and a culture where students are encouraged to take on the role of digital creators rather than being solely digital consumers.





# 7

## Conclusion

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The goal of this research, jointly conducted by UNESCO and the Institute of School Violence Prevention, Ewha Womans University in Korea, is to identify policy directions for governments that currently, or intend to, promote digital citizenship competencies in children. The study addressed this goal through a survey of the current levels of five digital citizenship domains among 15-year-old students in four countries across the Asia-Pacific region. The study is significant in that it clarifies the definition of 'digital citizenship' and provides a measurement tool for assessing progress on the concept. As the research is still in an early stage, there remain opportunities to capitalize on the strong start it provides.

Firstly, the concept and measurement tools for digital citizenship must continue to be developed. The advent of the 4th Industrial Revolution has accelerated the pace of social digitization and technological development. The DKAP Framework is a tentative result of a consensus around what constitutes digital citizenship, and operates as a formative concept. Given that there are many ongoing research projects on this topic, it will be necessary to create a regular platform for discussion in which different countries, organizations and experts can elaborate upon and improve the framework for 'digital citizenship'.

Secondly, DKAP can be used as a benchmark for periodic assessments to track changes over time. This study and research has resulted in a questionnaire that helps determine student's and countries' levels of digital citizenship, and the results of the pilot surveys conducted in each of the four participating countries provide insights that may be applied to policy-making in each country. As a comparative evaluation, it will be important to conduct DKAP on a regular basis, to establish progress and changes over time, and to evaluate opportunities and policies that might result. (A comparable example is the Programme for International Student Assessment (PISA) conducted every three years and led by the OECD. PISA was developed as an international comparison of scholastic aptitude for science, reading and mathematics. In addition, the IEA's Trends in International Mathematics and Science Study (TIMSS) is a series of

international assessments of the mathematics and science knowledge of students around the world conducted every four years. We hope that the DKAP will continue to develop and set the standard in becoming a de facto worldwide assessment programme).

Thirdly, four countries in the Asia-Pacific region have participated in the DKAP pilot test. In future assessments, it would be desirable to provide opportunities for more countries to participate while also ensuring that oft-marginalized groups are included, such as children with special needs, children with disabilities, and ethnic minorities and indigenous people, to gain a better understanding of “how the digital open up opportunities for the most vulnerable and disadvantaged” (Livingstone and Third, 2017, p. 12). Participation by more Member States will allow countries in the Asia-Pacific region to better compare the level of digital citizenship across the region, while also pursuing and progressing evidence-based regional development goals. As an international organization, UNESCO is well-placed to continue to take a lead in the application of DKAP which could be further developed to include countries elsewhere in the world. It is worth noting that assessment approaches such as the PISA and TIMSS had a low participation rate in the beginning. As the programmes were further developed, more countries joined in and the significance and utilization of the results have increased exponentially.

Fourthly, the DKAP assessment results offer valuable information for the development of national educational policies, the promotion of children's rights, and the building of a future-facing workforce. Fostering future talents has become a crucial component of national education policies. DKAP allows countries to reflect on the strengths and weaknesses of their children's progress towards competency as digital citizens. As educational policies develop to embrace a digital-first workforce, countries can focus on reinforcing existing strengths, while addressing established weaknesses. It is important to identify weak points from different angles, with involvement by those with a range of expertise including curriculum developers, IT educators and experts in IT infrastructure. In addition, case studies on how DKAP results have been applied to educational policies could be shared among countries to allow benchmarking and knowledge sharing. The research results reported here make an important start to these processes.

As stated earlier, research on digital citizenship is still at a nascent stage. Given the social changes brought about by the development of digital technology, however, it can be expected that this area of research will only become more important and prevalent. This study marks an important starting point for a long journey ahead as countries, international organizations, and NGOs participate in developing the concept of digital citizenship, and its measurement tools for the skills and competencies that are so vital for the future.



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# Glossary

**Bullied online** – Bullying constitutes a pattern of behaviour and can be defined as intentional and aggressive behaviour occurring repeatedly against a victim where there is a real or perceived power imbalance and where the victims feel vulnerable and powerless to defend themselves. Cyberbullying involves posting or sending electronic messages, including text, pictures or videos, aimed at harassing, threatening or targeting another person via a variety of media and social platforms such as online social networks, chat rooms, blogs, instant messaging and text messaging. Cyberbullying may include spreading rumours, posting false information, hurtful messages, embarrassing comments or photos, or excluding someone from online networks or other communications.<sup>1</sup>

**Digital citizenship** - being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one's own rights.

**Digital information** - Information, data, or records maintained in an electronic format and accessed through digital technologies. Simply, children can interpret digital information as all kinds of information they can access online (on the Internet).

**Child-centred approach** - Placing the child at the notional centre of the learning process in which they are active participants. Involves giving children choices of learning activities, with the teacher acting as facilitator of learning.<sup>2</sup>

**Cyberbullying** – see '*bullied online*'

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1 UNESCO (2017). School Violence and Bullying Global Status Report at 15. Retrieved from: <http://unesdoc.unesco.org/images/0024/002469/246970e.pdf> on 6 Sep 2018

2 <http://www.ibe.unesco.org/en/glossary-curriculum-terminology/c/child-centred-approach>

**Cybersecurity** - the collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance and technologies that can be used to protect the cyber environment and organization and user's assets.

**Digital divide** - the distinction between those who have Internet access and are able to make use of new services offered on the World Wide Web, and those who are excluded from these services.<sup>3</sup>

**Information and communications technology** - Diverse set of technological tools and resources used to transmit, store, create, share or exchange information. These technological tools and resources include computers, the Internet (websites, blogs and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players and storage devices) and telephony (fixed or mobile, satellite, video/video-conferencing, etc.).<sup>4</sup>

**Privacy policy** – A set of policies meant to help a user understand what information a website collects, why the website collects it, and how a user can update, manage, export, and delete the collected information.<sup>5</sup>

**Privacy setting[s]** – The part of a social networking website, Internet browser, piece of software, etc. that allows you to control who sees information about you.<sup>6</sup>

**Transversal skills** - Skills that are typically considered as not specifically related to a particular job, task, academic discipline or area of knowledge and that can be used in a wide variety of situations and work settings (for example, organizational skills).<sup>7</sup>

**Understanding Child Rights** - the ability to understand legal rights and obligations within the global and local context.

**Youth** - those persons between the ages of 15 and 24 years.<sup>8</sup>

3 <https://unevoc.unesco.org/go.php?q=TVETipedia+Glossary+A-Z&term=Digital+divide>

4 <http://uis.unesco.org/en/glossary-term/information-and-communication-technologies-ict>

5 Google, 2018

6 Cambridge Dictionary online

7 [http://www.ibe.unesco.org/fileadmin/user\\_upload/Publications/IBE\\_GlossaryCurriculumTerminology2013\\_eng.pdf](http://www.ibe.unesco.org/fileadmin/user_upload/Publications/IBE_GlossaryCurriculumTerminology2013_eng.pdf)

8 <https://www.un.org/development/desa/youth/what-we-do/faq.html>



## Annex 1: Table of Frameworks

### ***Review of digital citizenship concepts in education frameworks***

The concept of digital citizenship reflects how one can effectively utilize the opportunities provided by digital technologies, and address protection from, and the prevention of, risks. Recent definitions of digital citizenship competencies not only include digital skills, but also the social and emotional aspects of utilizing digital devices. This perspective reflects that competencies are more than just knowledge and skills, and according to the OECD (2005, p. 4), they require “the ability to meet complex demands, by drawing on and mobilizing psychosocial resources including skills and attitudes in a particular context”. This idea has attracted attention from researchers, practitioners, and policy-makers. Digital citizenship has been defined as the “norms of behaviour in regard to technology use” focusing on the individual user’s role (Ribble, Bailey, and Ross, 2004). Subsequently, Mossberger, Tolbert, and McNeal (2007) highlighted participating in society as an aspect of digital citizenship, which also requires the user to have sufficient technical competence and information literacy skills. In the context of the United States, digital citizenship was emphasized as a priority for K-12 learners as they were more vulnerable to inadequate information and the complexity of Internet-mediated situations when compared to adults (Internet Safety Technical Task Force, 2008; Hollandsworth, Dowdy, and Donovan, 2011).

The vast range of perceived opportunities and risks experienced by young people online has led to the development of numerous frameworks at the national and international level, for different contexts, that address digital citizenship fully or in part. Broadly speaking, these frameworks tend to either emphasize the opportunities offered by effective and productive use of digital technologies or protect and safeguard users from the risks of using digital technologies. It is also important to note that many of the organizations from whom the frameworks originate have updated their frameworks and related content over time in recognition of children’s changing patterns of use, interactions and engagement with digital devices and the Internet. The following section provides reviews of the most widely-used frameworks for digital citizenship. Although

each framework emphasizes slightly different aspects of digital citizenship, they all provide clear explanations for various components of digital citizenship.

Frameworks that emphasize the perspective of digital citizenship as being the ability to use digital technologies safely include Common Sense Education (Common Sense Media Inc, n.d.), Project DQ (DQ Institute, n.d.), and ThinkYoung Digital Resilience (ThinkYoung, Rimini, Howard and Ghersengorin, 2016).

- Common Sense Education defines the purpose of digital citizenship for K-12 learners as to “empower them to think critically, behave safely, and responsibly in the digital world” and focuses on eight topics: privacy and security, digital footprint and reputation, self-image and identity, creative credit and copyright, relationships and communication, information literacy, cyberbullying and digital drama, and Internet safety. With the exception of relationships and communication, and information literacy, six out of the eight topics relate to children’s safety and managing the risks that can occur in the digital environment.
- Project DQ defines digital citizenship as “the ability to take command of digital use in responsible and effective ways” and promotes digital citizenship education in eight areas: digital citizen identity, screen time management, digital footprint management, cyber bullying management, digital empathy, critical thinking, privacy management, and cyber security management. Along with Common Sense Education, most of the content, except for digital empathy and critical thinking, focuses on safe digital use.
- ThinkYoung Digital Resilience focuses on digital resilience, which is described as “a set of skills and attitudes that allow a young person to avoid and/or adapt to risky situations faced online.” As can be seen from this definition, digital resilience emphasizes avoiding and adapting to online risk through understanding children’s awareness of risks, their cognitive strategies for engaging and problem solving, instrumental actions to cope and respond to risk, and the types of communication adopted when faced with risk or upsetting situations.

Frameworks that focus on children’s ability to use digital technology effectively and to participate in society were developed by a range of leading organizations including the European Union’s DigComp (Vuorikari, Punie and Carretero, 2016), ICILS IEA (Fraillon, Schulz and Ainley, 2013), UNESCO MIL (UNESCO, 2013), UNESCO Global Citizenship Education (UNESCO, 2015), and UNESCO ERI-NET Transversal Skills (Care and Luo, 2016).

- EU DigComp offers five competency areas for citizens’ digital skills development: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. With the exception of the area on safety, all of these are concentrated upon using digital devices effectively to solve any problems created by using digital technologies, and to avoid creating new ones.
- ICILS IEA focuses on the development of Computer Information Literacy (CIL), which means “an individual’s ability to use computers to investigate, create, and communicate in order to participate effectively in home, at school, in the workplace, and in society.” As can be seen from this definition, ICILS IEA is a framework that emphasizes the effective use of digital and social participation.



- UNESCO's Media and Information Literacy (MIL) programme combines the disciplines of media literacy and information literacy and defines this as a "set of competencies that empowers citizens to access, retrieve, understand, evaluate and use, [and] create, as well as share information and media content in all formats, using various tools, in a critical, ethical and effective way, in order to participate and engage in personal, professional and societal activities." MIL considers the impact that media and information can have on an individual's digital experience and highlights the importance of the ability to obtain quality information and to use it in effective ways.
- UNESCO's Global Citizenship Education (GCED) emphasizes the holistic development of cognitive, socio-emotional, and behavioural dimensions that support a young person in engaging responsibly with the wider society. These dimensions include cognitive skills to think critically and creatively, social skills such as empathy and the ability to communicate with people from different backgrounds, and the behavioural capacities to act collaboratively in order to help solve global challenges. Specifically, GCED can play a role in fostering non-cognitive learning outcomes such as values, ethics, social responsibility, civic engagement, and citizenship.
- UNESCO ERI-NET Transversal Skills defines 21st century skills in four broad domains: critical and innovative thinking, inter-personal skills, intra-personal skills, and global citizenship. These domains, like the ICILS IEA, are frameworks in which effective digital use and social participation are highly emphasized in regard to building relationships with others, using digital technologies to solve problems, creating new technologies, and furthering digital citizenship as an active participant in society.

More recently, Global Kids Online (Livingstone, 2016) proposes a framework that reflects the integration of both the effective and safe aspects of ICT use in a comprehensive manner. The framework provides a quantitative tool that balances the two approaches to effectively use the opportunities provided by digital technologies while minimizing the risks associated with it. The twelve modules included in the quantitative tool are: child identity and resources, access, opportunities and practices, digital ecology, skills, risks, unwanted sexual experiences, well-being, family, school, peers and the community, and the parent module. Avoiding unwanted sexual experiences is a representative capability of secure digital use, and resources, access, and opportunities and practices that are closely related to how a person uses digital resources can be considered a representative competency for effective digital use.

Title	Definition	Core Competences
Australian Curriculum Assessment and Reporting Authority	Successful learner, confident and creative individual, and active and informed citizen	<ul style="list-style-type: none"> <li>• literacy</li> <li>• intercultural understanding</li> <li>• ethical understanding</li> <li>• personal and social capability</li> <li>• critical and creative thinking</li> <li>• ICT capability</li> <li>• numeracy</li> </ul>
Common Sense Education's Digital Citizenship Curriculum	People to "empower them to think critically, behave safely, and participate responsibly in the digital world."	<ul style="list-style-type: none"> <li>• privacy and security</li> <li>• digital footprint and reputation</li> <li>• self-image and identity</li> <li>• creative credit and copyright</li> <li>• relationships and communication</li> <li>• information literacy</li> <li>• cyberbullying and digital drama</li> <li>• Internet safety</li> </ul>
Project DQ (Digital Intelligence Quotient for Every child)	People with social, emotional, and cognitive abilities essential to digital life (i.e., digital citizenship skills).	<ul style="list-style-type: none"> <li>• digital citizen identity</li> <li>• screen time management</li> <li>• digital footprint management</li> <li>• cyber bullying management</li> <li>• digital empathy</li> <li>• critical thinking</li> <li>• privacy management</li> <li>• cyber security management</li> </ul>
EU DigComp	People possess transversal skills based on digital competence	<ul style="list-style-type: none"> <li>• Areas identified to be part of the digital competence includes the following five competence areas.</li> <li>• information and data literacy</li> <li>• communication and collaboration</li> <li>• digital content creation</li> <li>• safety</li> <li>• problem solving</li> </ul>

Title	Definition	Core Competences
International Computer and Information Literacy Study	Emphasis on individual's ability to use computers to investigate, create, and communicate.	<ul style="list-style-type: none"> <li>• It is divided into two strains.</li> <li>• Strand 1 emphasizes the collection of information</li> <li>• Strand 2 emphasizes the production and exchange of information.</li> </ul>
International Society for Technology in Education	People equipped with the necessary skills to be able to react effectively to future challenges.	<ul style="list-style-type: none"> <li>• empowered learner</li> <li>• global collaborator</li> <li>• creative communicator</li> <li>• computational thinker</li> <li>• innovative designer</li> <li>• knowledge constructor</li> <li>• digital citizen</li> </ul>
OECD Skills Research	The study is designed to measure three main domains of adult proficiency in literacy, numeracy, and problem solving skills. Of the three domains, proficiency in literacy and proficiency in problem solving are related to ICT competencies.	<ul style="list-style-type: none"> <li>• literacy is defined as the ability to understand, evaluate, use and engage with written texts in order to participate in society, achieve one's goals, and develop one's knowledge and potential.</li> <li>• Problem solving in technology-rich environments is defined as the ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks.</li> </ul>
ThinkYoung Digital Resilience	The centre of the study is the concept of digital resilience, which encompasses a set of skills and attitudes that allow young persons to avoid and/or adapt to risky situations faced online.	<ul style="list-style-type: none"> <li>• awareness of the risks present</li> <li>• cognitive strategies to engage and problem-solve</li> <li>• instrumental actions to cope and respond to risk</li> <li>• communication when faced with risk or upsetting situations</li> </ul>

Title	Definition	Core Competences
UNESCO ERI-NET Transversal Skills	Transversal skills are referred to as 21 <sup>st</sup> century skills and include innovative thinking, creativity, adaptability, respect, global awareness and communication, among others.	<ul style="list-style-type: none"> <li>• critical and innovative thinking</li> <li>• inter-personal skills</li> <li>• intra-personal skills</li> <li>• global citizenship</li> </ul>
UNESCO Global Citizenship Education	People with Global citizenship at cognitive, socio-emotional, and behavioural dimensions.	<ul style="list-style-type: none"> <li>• cognitive: acquiring knowledge, critical thinking about global, regional, nation and local issues.</li> <li>• socio-emotional: having a sense of belonging to a common humanity, sharing values and responsibilities, empathy, solidarity and respect for differences and diversity.</li> <li>• behavioural: acting effectively and responsibly at local, national and global levels.</li> </ul>
UNESCO Media Information Literacy	Emphasis on two literacy skills; 1) Information literacy 2) access to information and evaluation of its use.	<ul style="list-style-type: none"> <li>• define and articulate information needs</li> <li>• locate and access information</li> <li>• assess information</li> <li>• organize information</li> <li>• make ethical use of information</li> <li>• communicate information</li> <li>• use ICT skills for information processing</li> </ul>
	2) Media literacy; the skills of understanding, evaluating, and engaging with media.	<ul style="list-style-type: none"> <li>• understand the role and functions of media in democratic societies</li> <li>• understand the conditions under which media can fulfill their functions</li> <li>• critically evaluate media content in the light of media functions</li> <li>• engaging with media for self-expression and democratic participation</li> <li>• review skills (including ICTs) needed to produce user-generated content</li> </ul>

## **Analysis and definitions for a Framework for Education**

The section below describes the five digital citizenship competency domains of the DKAP Framework in detail.

### ***Digital Literacy***

Digital Literacy is the ability to seek, critically evaluate and use digital tools and information effectively to make informed decisions. It is related to the effective use of digital tools and information in the cognitive domain. The DKAP Framework proposes two competencies within the Digital Literacy domain: 1) ICT Literacy; and 2) Information Literacy.

#### **ICT Literacy**

ICT Literacy is the ability to manage and operate ICT hardware and software responsibly in digital environments to access and search for data, information, and content, and utilize them. DKAP assesses the child's ability to use technology responsibly in digital environments to access and utilize information. ICT Literacy is discussed as an important digital literacy competency in that it is the basic technological skill for conducting various online activities such as information acquisition, management, evaluation, and social participation through online interaction (Moto, Ratanaolarn, Tuntiwongwanich and Pimdee, 2018).

#### **Information Literacy**

Information literacy is the ability to seek, critically evaluate and use digital information effectively to make informed decisions. DKAP assesses the information literacy skills of children in terms of their ability to search, critically evaluate and effectively use digital information to make informed decisions. Information literacy is also an important digital literacy competency given that many learners have difficulty in finding reliable websites, evaluating information, and making decisions based on them in a digital space that is bombarded with information (Hatlevik and Hatlevik, 2018; Mason et al., 2014).

### ***Digital Safety and Resilience***

Digital Safety and Resilience relate to young people's ability to protect themselves and others from harm in digital space. Due to the vulnerability of K-12 learners in digital space, several organizations have suggested various competencies related to the safe use of ICTs. The DKAP Framework proposes four competencies within the Digital Safety and Resilience domain: 1) Understanding Child Rights; 2) Personal Data, Privacy, and Reputation; 3) Promoting and Protecting Health and Well-Being; and 4) Digital Resilience.

#### **Understanding Child Rights**

Understanding Child Rights is the ability to understand children's legal rights and obligations within the global and local context. In the online context, children should be encouraged to be active in learning, collaborating and creativity. However, given well-founded concerns about safety, children need to understand their rights and obligations in terms of what they can do and

what is prohibited. DKAP assesses the child's ability to understand legal rights and obligations in a digital context.

### **Personal Data, Privacy, and Reputation**

Personal Data, Privacy, and Reputation relate to understanding how to use and share personally identifiable information, while being able to protect oneself and others from harm. It also refers to a child's ability to implement strategies for information and device security and personal security protocols. DKAP assesses the child's knowledge of how to protect their personal information online, how to respect others' privacy when using digital information, and which information is appropriate to share and which is not.

### **Promoting and Protecting Health and Well-Being**

Promoting and Protecting Health and Well-Being assesses the child's ability to identify and manage health risks, and use digital technology in order to protect and improve their physical and psychological well-being, and the well-being of others. The health and well-being of children can be enhanced with the use of technology, however, children need to be careful to monitor and regulate themselves not to overuse ICT, since this may result in harmful health effects. DKAP assesses the ability of children to manage health risks by using technology and how to protect and improve their health through the use of technology.

### **Digital Resilience**

Digital Resilience is the ability to prevent, react to and transform experiences in ways that allow young people to avoid or cope with the risky situations they face, thereby improving their skills, competencies and outlook. DKAP assesses the abilities of children in preventing and responding to risks, such as by ignoring the risk, discussing the risk with others, or using proactive digital skills to resolve the risk.

### ***Digital Participation and Agency***

Digital Participation and Agency is the ability to equitably interact, engage and positively influence society through ICT. It can be categorized as a behavioural domain, which is relevant to key competencies such as communication and collaboration (European Commission, n.d.), global collaboration (ISTE, 2016), and interpersonal skills (Care and Luno, 2016). As a summary, in DKAP Digital Participation and Agency addresses sharing information with others, cooperating and participating in ICT-based activity for positive local and global outcomes, and netiquette-based interaction. Three competencies are proposed within the Digital Participation and Agency domain: 1) Interacting, Sharing and Collaborating; 2) Civic Engagement; and 3) Netiquette.

### **Interacting, Sharing and Collaborating**

Interacting, Sharing and Collaborating is the ability to interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals. Online social skills for interacting and collaborating with others are key components of future competencies. Given that the online environment is more diverse than offline, learners should be prepared

to communicate beyond their own country and cultural background. DKAP assesses whether learners can communicate with people of diverse backgrounds, sharing their own information, and creating new relationships online in order to achieve shared goals in a diverse digital environment.

### **Civic Engagement**

Civic Engagement is the ability and willingness to recognize, seek out, and act upon opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use. It is generally defined as a beneficial behaviour for promoting the common good through community service and support as well as via political participation (Jones and Mitchell, 2016). Specifically, civic engagement is focused on solving community problems rather than general political participation in government action or policies (Gil de Zúñiga, Jung and Valenzuela, 2012). DKAP assesses whether learners share their views on social issues online and whether they are engaged in digital activities that try to solve community problems.

### **Netiquette**

Netiquette is the ability to demonstrate ethical and courteous behaviour when interacting and engaging in different digital environments with different audiences and participants. It serves as a moral and ethical norm for online activities (Park, Na and Kim, 2014). In other words, netiquette requires that online activities accord with moral standards. DKAP assesses netiquette as an active norm in online environment, investigating children's awareness of their own behaviours while respecting the rights of others in the digital environment.

### ***Digital Emotional Intelligence***

Digital Emotional Intelligence is the ability to recognize, navigate and express emotions in intrapersonal and interpersonal digital interactions. It relates to the use of digital tools and resources in the socio-emotional domain. Problems caused by anonymity can be more easily encountered in digital space, which is also characterized by a lack of good quality visual and verbal cues. Thus, digital emotional intelligence becomes more important, as it is not only about emotional self-control in digital space, but also about an emotional awareness of others and an ability to use emotional expression. The DKAP Framework proposes that Digital Emotional Intelligence includes both intra-, and inter-personal skills with five competencies: 1) Self-awareness, 2) Self-regulation, and 3) Self-motivation – which are included as intrapersonal competencies; and 4) Interpersonal Skills, and 5) Empathy – which are interpersonal competencies.

### **Self-Awareness**

Self-Awareness is an individual's ability to explain their moods, emotions, drives, and how these affect themselves and others in the digital world through introspection. Strong self-awareness can lead to the adjustment of individual behaviour to meet the expectations of others (Govern and Marsch, 2001). In an online context where a young person is exposed to multiple opinions,

self-awareness can have a significant impact on communication and interaction. DKAP assesses the feelings of children in online interactions.

### **Self-Regulation**

Self-Regulation is the ability of a person to manage their emotions, moods and impulses during online engagements. The regulation of emotion can be divided into a focus on the self and on others (Salovey and Mayer, 1990), and this study focuses on regulating the self. Regulation and self-management of emotions in the online environment supports learning and positive activity. DKAP measures the ability of children to control their behaviour and emotions when using digital technologies.

### **Self-Motivation**

Self-Motivation supports a child's ability to demonstrate initiative and commitment to attain internal or external goals despite setbacks. In the digital environment, motivation is required in terms of digital device use along with motivation to engage in positive social activities. DKAP measures learners' capacity to be motivated by the results of their online activities, and whether or not they are willing to rise to the challenge of using digital devices.

### **Interpersonal Skills**

Interpersonal Skills address a child's ability to engage in positive online relationships to communicate, build rapport and trust, embrace diversity, manage conflicts and make sound decisions. These skills are evident in the ability to interact emotionally, listening to others, making relationships, working cooperatively, and problem-solving in order to achieve shared goals (Moely, Mercer, Ilustre, Miron and McFarland, 2002). The online environment typically lacks the richness of face-to-face interaction and may require communication by text alone (Doo, 2006). Thus, interpersonal skills are important for negotiating differences between people in the digital world. DKAP measures whether children can understand the feelings of others, interact with people of diverse backgrounds, and whether they can resolve conflicts.

### **Empathy**

Empathy is the ability to demonstrate awareness of and compassion for the feelings, needs and concerns of others during digital interactions. It means understanding and recognizing not only emotions but also another's situations and thoughts. In online situations that may lack non-verbal elements such as facial expressions and voice cues, text becomes the main cue for empathy. Empathic accuracy affects the development of online trust, and it can be seen that empathetic skill is necessary to build relationships in text-oriented contexts (Feng, Lazar and Preece, 2004). This study measures whether children can relate to others in online interactions, and whether they can empathize with different points of view.

### **Digital Creativity and Innovation**

Digital Creativity and Innovation is a child's ability to express and explore him or herself through the creation of content using ICT tools. It is related to the use of digital tools and resources,



especially in regards to the production of tangible products and self-expression online. The acquisition of knowledge is important, but it is also crucial that a digital citizen can express him or herself based on that acquired knowledge and information to solve problems and support change. In digital terms, this domain emphasizes a child's capacity to generate positive outcomes based on digital literacy.

### **Creative Literacy**

Creative Literacy is the ability to apply skills and use tools to create/adapt/or curate digital content. Creation of information means representing information using text and graphics. It corresponds with both generating entirely new information and building upon a given set of information to generate new understanding. Modern society emphasizes creation as well as the acquisition of information and knowledge through digital tools and resources. Therefore, DKAP measures whether learners are able to produce new digital content, make changes to existing digital content, and express their thoughts and opinions through the use of digital content.

### **Expression**

Expression is the ability of young people to use technology to represent or creatively express their identities. In the online environment, anonymity and multiple identities are readily available (Choi, Park and Chai, 2016). Since the shifting of digital identities may affect the formation of positive ethical and social identities (Choi et al., 2016; Livingstone, 2008), a child's ability to express him or herself appropriately online may support sound online engagement and beneficial human development. DKAP focuses on exploring the range of expression of children in digital space.

# Annex 2: Survey Questionnaire (as of 22 April 2019)

## Digital Kids Online Survey

The questionnaire examines children's attitude, behaviours, competency levels, and use of ICT when engaging with the Internet or digital technologies in their everyday lives. It has been developed by the Institute of School Violence Prevention at Ewha Womans University, South Korea, in consultation with the UNESCO Bangkok. It is a work in progress and will be further developed through pilot research by partners in Bangladesh, Viet Nam, South Korea, and Fiji.

*[Students do not fill out the following blank]*

<b>Student ID</b>						
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<b>School ID</b>		
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INSTITUTE OF  
SCHOOL VIOLENCE PREVENTION  
E-WHA WOMANS UNIVERSITY

Please read each question carefully and answer as accurately as you can.

In tests, you usually circled your answers. For this questionnaire, you will normally answer by darkening a circle. For a few questions you will need to write a short answer.

If you make a mistake when darkening a circle, erase your mistake and darken the correct circle. If you make a mistake when writing an answer, simply cross it out and write the correct answer next to it.

In this questionnaire, there are no right or wrong answers. Your answers should be the ones that are right for you.

You may ask for help if you do not understand something or are not sure how to answer a question.

Your answers will be combined with answers from other students to calculate totals and averages. All information (or responses) you provide may only be used for statistical purposes and may not be disclosed, or used, in identifiable form for any other purpose.

## Note

People use the Internet differently, so let's now talk about how you use it. Think about all the different ways you might use the Internet, such as emailing, visiting websites, or chatting with your friends. Also think about how you use digital devices at school or home. Digital devices, technically, mean electronic devices that can receive, store, process or send digital information. They can include your mobile phones, tablet PCs, laptops or desktop computers to send or receive messages, emails, browse or to chat with friends and family, or anything else that you usually do online.

## Section A

## A. How much do you agree with the following statements?

*Fill one circle for each line.*

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
A1	I can edit electronic resources (e.g., text, graphics, audio, videos)	①	②	③	④
A2	I use social media platform (e.g., Facebook, Instagram, Snapchat, LINE, We Chat) to share ideas, participate in discussions, and collaborate with others.	①	②	③	④
A3	I can set up a safe computing environment (e.g., remove computer viruses, install security programs/antivirus).	①	②	③	④
A4	I can transfer photos, music, and video files saved on my computer into other digital devices (e.g., mobile phone, tablet PC).	①	②	③	④
A5	I use computer software (e.g., Microsoft Word, Microsoft PowerPoint, Google Docs) to complete learning tasks at school.	①	②	③	④
A6	I know how to use the latest digital devices.	①	②	③	④
A7	I use digital devices in order to search for information and application I need.	①	②	③	④
A8	I use digital devices for learning at home.	①	②	③	④
A9	I use digital devices for my personal interest (e.g., games, chatting, shopping, searching for information).	①	②	③	④
A10	I assess the relevance of the digital information to complete learning tasks at school.	①	②	③	④
A11	I can separate reliable from unreliable information when searching for digital information.	①	②	③	④
A12	I search for and find information to complete learning tasks on the Internet.	①	②	③	④
A13	I know I need to report the source of information when using information attained from online.	①	②	③	④
A14	If I find wrong information on the Internet, I can correct it.	①	②	③	④

## Section B

## B. How much do you agree with the following statements?

Fill one circle for each line.

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
B1	I understand I should show respect to the others on the Internet.	①	②	③	④
B2	I understand I should protect the privacy and security of the others.	①	②	③	④
B3	Since it is against the copyright law to copy software illegally, I would not let myself make a copy.	①	②	③	④
B4	I read the privacy policy of websites I visit when using the Internet.	①	②	③	④
B5	I try to avoid threatening other people's personal information when using digital information.	①	②	③	④
B6	I try to avoid infringing other people's intellectual property rights (e.g., software copyrights, portrait rights) when searching for and using digital information.	①	②	③	④
B7	I try to protect my personal information from others online.	①	②	③	④
B8	I know which information I should and should not share on the Internet.	①	②	③	④
B9	I find myself using on digital devices for longer periods of time than intended.	①	②	③	④
B10	I use digital devices to relieve myself from stress (e.g. listening to music, watching movies, SNS).	①	②	③	④
B11	I feel anxious if I have not checked for messages or switched on digital devices for some time.	①	②	③	④
B12	I can modify privacy setting to keep myself safe/away from unwanted contacts (e.g., spam texts, emails).	①	②	③	④
B13	I try to avoid clicking on information that look weird or suspicious.	①	②	③	④
B14	I can ask the person to stop sending unwanted disturbing messages or emails.	①	②	③	④

**B15-18. Think about how you will react on the following situation:**

**B15.** How will you react when you are exposed to unwanted disturbing file or website (e.g., pornography website, violent media)? Choose **all** that apply.

1. Get rid of it immediately by closing the page, deleting the file, or scrolling away
2. Talk about it with parents/caregivers
3. Use a program that prevents it from happening again
4. Talk about it with a friend
5. Look away or close my eyes
6. Keep looking
7. Block the webpage or website
8. Don't know what to do

**B16.** How will you react when you receive unwanted disturbing messages including annoying messages or embarrassing pictures from someone on your contact list? Choose **all** that apply.

1. Block and report the person
2. Delete the contact
3. Ignore the messages and the person
4. Talk with parents/caregivers about what to do
5. Ask the person to stop sending these messages or pictures
6. Talk with teachers about what to do
7. Report the issue to the police and show them what happened
8. Don't know what to do

**B17.** How will you react when you find that your personal information is misused, compromised or acquired without permission online? Choose **all** that apply.

1. Change password
2. Review privacy settings and choose a more secure password
3. Use a report button
4. Disable or delete the account and make a new account
5. Ask parents/caregivers to help
6. Ask teachers to help
7. Report the issue to the police and show them what happened
8. Don't know what to do

**B18.** How will you react when you are bullied online by friends or others? Choose **all** that apply.

1. Block and report the persons
2. Delete the contact
3. Show the persons I am not bothered by their behaviour by ignoring them
4. Talk with parents/caregivers about what to do
5. Ask the persons to stop sending annoying messages or pictures
6. Talk with teachers about what to do
7. Report the issue to the police and show them what happened
8. Keep the evidence of bullying (e.g., screen shot)
9. Don't know what to do



## Section C

## C. How much do you agree with the following statements?

*Fill one circle for each line*

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
C1	I use the Internet to talk to people from places or backgrounds different from mine.	①	②	③	④
C2	I use the Internet to share something I am good at or I know well.	①	②	③	④
C3	I can share my knowledge online to anyone if it is helpful to him/her.	①	②	③	④
C4	I make a new friendship online.	①	②	③	④
C5	I post news on social issues online (e.g., Facebook, Instagram, blog).	①	②	③	④
C6	I use the Internet to make a solution on my school problems.	①	②	③	④
C7	I use the Internet to make a solution on my town/community problems.	①	②	③	④
C8	I get involved online in social issues.	①	②	③	④
C9	If I disagree with people online, I watch my language so that it doesn't come across as mean.	①	②	③	④
C10	I am careful to make sure that the pictures I post or send will not embarrass other people or get them into trouble.	①	②	③	④
C11	My favorite online places are where people are respectful toward each other.	①	②	③	④
C12	I do not add to arguments and insulting interactions that happen on the Internet.	①	②	③	④

## Section D

## D. How much do you agree with the following statements?

Fill one circle for each line

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
D1	I am aware of my feelings that I experience in my interactions online.	①	②	③	④
D2	I express myself in a way that makes a good impression on others when I write a post or comments on SNS (e.g., Facebook, Instagram).	①	②	③	④
D3	I am aware of the meaning of non-verbal messages (e.g., smiley face, emoji) that I send to other people on the Internet.	①	②	③	④
D4	I express my feelings freely on the Internet using online communications.	①	②	③	④
D5	I manage my feelings when I talk with other people on the Internet.	①	②	③	④
D6	Even though I get distracted during online classes or activities, I can easily go back to my work again.	①	②	③	④
D7	I stick on my goals when I use the Internet to do assignment at home.	①	②	③	④
D8	I am motivated by the good results that my group can get from the projects that we do online.	①	②	③	④
D9	Even though I face challenges while using digital devices, I solve the problem without giving up.	①	②	③	④
D10	When I use digital devices or software (e.g., programs, applications) for the first time, I expect I am able to do well.	①	②	③	④

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
D11	I communicate comfortably with people who have different backgrounds, appearances, and opinions on the Internet.	①	②	③	④
D12	I help other people feel better when they are not feeling well on the Internet (e.g., when they read negative comments or see awful pictures of themselves posted by others).	①	②	③	④
D13	I know how to resolve the conflicts that arise when I interact with people from diverse backgrounds on the Internet.	①	②	③	④
D14	When I meet friends online, I easily empathize with their emotions.	①	②	③	④
D15	When I talk with friends on the Internet, I understand their perspectives even if I disagree.	①	②	③	④
D16	When I meet friends on the Internet, I easily recognize what they want to talk about.	①	②	③	④

## Section E

## E. How much do you agree with the following statements?

*Fill one circle for each line*

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
E1	I make changes to the digital contents (e.g., photos, videos, music, text, etc.) that others have produced.	①	②	③	④
E2	I remix existing digital contents by using digital media software(e.g., programs, applications).	①	②	③	④
E3	I create presentation slides to support my ideas or opinions.	①	②	③	④
E4	I create something new from existing digital contents.	①	②	③	④
E5	I express my ideas through selecting, organizing, and sharing existing digital materials.	①	②	③	④
E6	I use the Internet to try out different ways of expressing myself.	①	②	③	④
E7	I express my personality online.	①	②	③	④
E8	I show a better version of myself online.	①	②	③	④
E9	I express who I want to be online.	①	②	③	④
E10	There are certain things I express about myself more freely online than offline.	①	②	③	④
E11	When I'm online, I present myself how I want others to view me.	①	②	③	④

## Section F

**F1.** Are you a girl or a boy?

1. Girl
2. Boy

**F2.** When were you born? Month (January-December) \_\_\_\_\_ Year \_\_\_\_\_

**F3.** What grade are you in? \_\_\_\_\_

**F4.** What language do you speak at home most of the time?

1. Test language
2. Other, please specify \_\_\_\_\_

**F5.** Which country were you born in?

1. Test country
2. Other, please specify \_\_\_\_\_

**F6.** What is the highest grade or level of school you expect to complete?

1. Lower secondary
2. Upper secondary
3. Post-secondary
4. Masters/ Doctoral
5. I don't know

**F7. How many days were you absent from school in the last month?**

[Note: The month should not include school vacation or holidays]

1. None
2. 1 or 2 days
3. 3 or 4 days
4. 5 to 10 days
5. More than 10 days

**F8. Outside of school, how much time each day do you usually spend doing the following activities?**

	Less than an hour	1-2 hour a day	3-4 hours a day	5-6 hours a day	7 hours a day or more
F8-1) Having fun with friends	①	②	③	④	⑤
F8-2) Helping my family with work, housework or looking after somebody	①	②	③	④	⑤
F8-3) Doing homework or other study activities (e.g., private education)	①	②	③	④	⑤
F8-4) Participating in volunteer work	①	②	③	④	⑤
F8-5) Doing fine arts activities (e.g., drawing or playing an instrument)	①	②	③	④	⑤

## Section G

**G1.** How long have you been using digital devices (e.g., desktop/laptop, smartphone, tablet PC)?

1. Never
2. Less than 1 year
3. 1-2 years
4. 3-4 years
5. More than 5 years

**G2.** How often do you go online or use the Internet using digital devices (e.g., smartphone, desktop/laptop, tablet PC) per day?

1. Hardly ever
2. Less than an hour
3. 1-2 hour
4. 3-4 hours
5. 5-6 hours
6. 7 hours or more

**G3.** Where do you usually access Internet?

	Hardly ever	At least every month	At least every week	Daily or almost daily				
				Less than an hour	1-2 hour a day	3-4 hours a day	5-6 hours a day	7 hours a day or more
G3-1) Home	①	②	③	④	⑤	⑥	⑦	⑧
G3-2) School	①	②	③	④	⑤	⑥	⑦	⑧
G3-3) Internet Cafe	①	②	③	④	⑤	⑥	⑦	⑧
G3-4) local community or local district (e.g., local library, community center)	①	②	③	④	⑤	⑥	⑦	⑧

**G4.** Do you have access to any of these things at your home? Please check **all** that apply.

1. Desktop computer
2. Laptop
3. Smartphone
4. Tablet PC (e.g., iPad, Galaxy Tab)
5. Printer
6. None of the above



**G5.** Do you have access to any of these things in your school? Please check **all** that apply.

1. Desktop computer
2. Laptop
3. Smartphone
4. Tablet PC (e.g., iPad, Galaxy Tab)
5. Printer
6. None of the above

**G6.** Do you have access to any of these things in your local community (e.g., local library, community center)? Please check **all** that apply.

1. Desktop computer
2. Laptop
3. Smartphone
4. Tablet PC (e.g., iPad, Galaxy Tab)
5. Printer
6. None of the above

**G7.** Which of the following can you access at home? Please check **all** that apply.

*[Note. Wireless Internet means Internet connectivity via radio waves rather than wires. Simply imagine Wifi. Wired Internet means Internet connectivity using a network hub via a wired connection like satellite, cable, DSL, etc.]*

1. Wired Internet
2. Wireless Internet
3. None

**G8.** Which of the following can you access at school? Please check **all** that apply.

1. Wired Internet
2. Wireless Internet
3. None

**G9.** Does your local community (e.g., local library, community center) or local district provide any place to use the Internet?

1. Yes
2. No

**G10.** Which of the following can you access in your local community or local district? Please check **all** that apply.

1. Wired Internet
2. Wireless Internet
3. None

**G11.** Who taught you most about how to use computers?

1. My teachers
2. My friends
3. My family
4. I learned myself
5. My local community (e.g., local library, community center)
6. Others

**G12.** Who taught you most about how to use the Internet?

1. My teachers
2. My friends
3. My family
4. I learned myself
5. My local community (e.g., local library, community center)
6. Others

**G13.** How often do you use computers or the Internet for school study (e.g., doing homework, preparing and reviewing classes) per day?

1. Hardly ever
2. Less than an hour
3. 1-2 hour
4. 3-4 hours
5. 5-6 hours
6. 7 hours or more

**G14.** How often do you use computers or the Internet for studying for personal purpose (e.g., studying English, preparing certificates, or searching information for your career) per day?

1. Hardly ever
2. Less than an hour
3. 1-2 hour
4. 3-4 hours
5. 5-6 hours
6. 7 hours or more

**G15.** How often do you use computers or the Internet for leisure (e.g., computer games, music, comics, videos) per day?

1. Hardly ever
2. Less than an hour
3. 1-2 hour
4. 3-4 hours
5. 5-6 hours
6. 7 hours or more

**G16.** How often do you use computers or the Internet for socializing with your friends (e.g., Social Network Services, messenger program, blog) per day?

1. Hardly ever
2. Less than an hour
3. 1-2 hour
4. 3-4 hours
5. 5-6 hours
6. 7 hours or more

**G17.** Have you ever learned basic coding skills at school?

1. Yes
2. No

**G18.** Have you ever developed websites or applications?

1. Yes
2. No

## Section H

### H1. Who usually lives at home with you? Please check **all** that apply

1. Mother (including step or foster mother)
2. Father (including step or foster father)
3. Grandparent(s) or other relatives
4. Siblings (including half, step or foster siblings)
5. I live in a foster home or children's home
6. I live alone
7. Someone or somewhere else (please state) : \_\_\_\_\_

### H2. What is the highest level of schooling completed by your mother?

1. No Education
2. Primary
3. Lower secondary
4. Upper secondary
5. Post-secondary
6. Masters/ Doctoral
7. I don't know

### H3. What is the highest level of schooling completed by your father?

1. No Education
2. Primary
3. Lower secondary
4. Upper secondary
5. Post-secondary
6. Masters/ Doctoral
7. I don't know

**H4.** Do you have the following item(s) at your home?

	Yes	No
H4-1) Car	①	②
H4-2) Television	①	②
H4-3) Bathrooms with a bathtub or shower	①	②

**H5.** How many books are there in your home?

[Note. There are usually about 15 books per foot of shelving. Do not include magazines, newspapers, or your schoolbooks.]

1. 0-10 books
2. 11-25 books
3. 26-100 books
4. 101-200 books
5. 201-500 books
6. More than 500 books

**H6.** When you use the Internet, how often do the following person/people suggest ways to use the Internet safely?

	Never	Hardly ever	Some-times	Often	Very often	All the time
H6-1) parents/caregivers	①	②	③	④	⑤	⑥
H6-2) teachers	①	②	③	④	⑤	⑥
H6-3) siblings	①	②	③	④	⑤	⑥
H6-4) peers	①	②	③	④	⑤	⑥

**H7.** When you use the Internet, how often do the following person/people encourage you to explore or learn things on the Internet?

	Never	Hardly ever	Some-times	Often	Very often	All the time
H7-1) parents/caregivers	①	②	③	④	⑤	⑥
H7-2) teachers	①	②	③	④	⑤	⑥
H7-3) siblings	①	②	③	④	⑤	⑥
H7-4) peers	①	②	③	④	⑤	⑥

### Suggested questions for the Promoting and Protecting Health and Well-Being competency

Promoting and Protecting Health and Well-Being: Ability to identify and manage health risks, and use digital technology in order to protect and improve the physical and psychological well-being of oneself and others

1. I can control the amount of time I spend online.
2. I can control my use of digital devices (e.g., playing smartphone games).
3. I try to spend less time online to protect my mental and physical health.
4. I use digital devices to relieve myself from stress.
5. I use the Internet to make myself feel better.

### Reference list:

- Caplan S. E. 2002. Problematic Internet use and psycho-social wellbeing: development of a theory based cognitive-behavioural measurement instrument. *Computers in Human Behaviour*, 18, 553-575.
- Caplan, S.E. 2010. Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behaviour*, 26, 1089–1097.
- Khazaal Y, Billieux J, Thorens G, et al. 2008. French validation of the Internet Addiction Test. *Cyberpsychology & Behaviour*, 11(6), 703-706.



## Annex 3: Survey Translation Process, Training Manual, and Checklist

### Translation process

A master questionnaire is finalized in English. National versions will be then produced in appropriate languages. The overarching principle of the translation and adaptation process is that the meaning and difficulty of the questions, instructions, and tasks in the instruments should be equivalent across all countries after completion of the adaptation and translation work. The focus is on cross-cultural and conceptual, rather than on linguistic/literal equivalence. Each national team is responsible for coordinating the translation verification of all instruments.

#### Test Language by Country

Country	Language
Viet Nam	Vietnamese
South Korea	Korean
Fiji	English
Bangladesh	Bangla

Principles of translation are as follows:

- Translators should always aim at the conceptual equivalence of a word or phrase, not a word-for-word translation, i.e. not a literal translation. They should consider the definition of the original term and attempt to translate it in the most relevant way.
- Translators should strive to be simple, clear and concise in formulating a question. Fewer words are better. Long sentences with many clauses should be avoided.
- The target language should aim for the most common audience of youth. Translators should consider the typical respondent for the instrument being translated and what the respondent will understand when s/he hears the question.



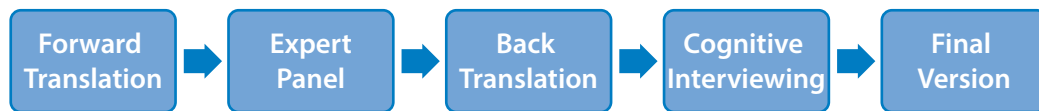
- Translators should consider issues of gender and age applicability and avoid any terms that might be considered offensive to the target population.

Essential qualifications for translators include:

- Excellent knowledge of English and target language;
- Basic knowledge on contents (i.e., digital citizenship);
- Experience or knowledge in survey design.

Implementation of translation and adaptation includes the following steps:

### Steps in Translation Process



- **Forward Translation:** Two researchers experienced in opinion surveys independently translating the questionnaire and compiling the two translations into one.
- **Expert Panel:** At least one expert panel who is bilingual (in English and the target language for translation) identify and resolve the inadequate expressions/concepts of the translation, as well as any discrepancies between the forward translation. All necessary adjustments are made to the modified questionnaire.
- **Back Translation:** The modified questionnaire should then be sent to back-translation by a native English speaker with a sufficient level of knowledge in the source language. The back-translated documents should be checked against the original English questionnaire by national research team. All necessary adjustments are made to the modified questionnaire.  
  
As well, back-translation document should be sent to and verified by ISVP or UNESCO team (See Annex B). Iterative process of refinement and modification will be conducted until agreement among national research team and ISVP is reached.
- **Cognitive Interviewing (not required but recommended):** Cognitive interviewing is recommended on the target population, making sure that the questions make sense to children after translation. Pre-test respondents are administered the instrument and be systematically debriefed. Respondents are asked:
  - What they thought the question is asking;
  - Whether they could repeat the question in their own words;
  - What comes to their mind when they heard a particular phrase or term;

- How they choose their answer; and/or
- Whether there is any word they did not understand as well as any word or expression that they found unacceptable or offensive.

These questions should be repeated for each item. The answers to these questions should be compared to the respondent's actual responses to the instrument for consistency. All necessary adjustments were made to the final questionnaire by the national research team.

- **Final Version:** The final version of the instrument in the target language should be the result of all the iterations described above. All the cultural adaptation procedures should be traced briefly through the appropriate document and sent back to the ISVP team. It may include a summary of recommendations by the expert panel and cognitive interviewing and the modifications proposed.

## Training Manual

# Digital Kids Online Survey

Training Manual

## Introduction

The purpose of this manual is to provide step-by-step instructions to help survey administrators successfully administer the survey.

It is essential that the procedures described in this manual be followed carefully to ensure that the survey sessions are administered the same way in all participating schools and across countries. Failure to do so might invalidate the results of the survey.

## Responsibilities of Survey Administrator

- To administer the survey session
- To ensure that consistent procedures are followed on the day of the assessment for the security and validity of the survey
- To communicate and coordinate with the School Coordinator
- To ensure that proper survey-taking conditions are provided

## Overview of DKAP Survey

- DKAP survey aims to measure Asia-Pacific children's ICT practices, attitudes, behaviors, and competency levels.
- Results of the survey contribute to establish evidence-based understandings of children's safe, effective and responsible use of ICT within an educational context across Asia-Pacific countries.
- DKAP survey takes approximately one hour.

Activities	Length
Preparation of students and reading of instructions	Approx. 10 min.
Administering the main and contextual questionnaire	45 min.
Collecting the instrument materials and ending the session	Approx. 5 min.
Total	60 min.

## • Survey Administrator's Key Activities

Stage	Timing	Activity
Before the survey day	Before training	Receive notice of assessment dates and times from the School Coordinator
	Training sessions	Familiarize himself/herself with questionnaire items Confirm survey plans with the school coordinator
	One day prior to the assessment	Confirm all of the necessary arrangements and materials with the School Coordinator
On the survey day	1 hour before the assessment	Set up rooms and materials
	Survey session	Ensure there are enough copies to distribute to every student Administer the DKAP survey
	After survey session	Return all survey materials to the school coordinator

## Before the survey day

- **Receive notice of survey dates and times**
  - The School Coordinator should let survey administrators know the dates, times and schools/classes after the survey participation of the given school is confirmed.
- **Take training sessions**
  - All survey administrators are recommended to take interactive training session offline/online.
  - During the training session, survey administrators should be familiar with questionnaire items. They may need to respond to students' queries about particular items if students are having difficulties in answering them. Also, administrators need to know the survey procedures.
- **Confirm all of the necessary arrangements and materials with the School Coordinator**
  - Plan all the steps required for the survey sessions with the School Coordinator (e.g., arranging room locations, ensuring that there is a sufficient number of desks or tables, and arranging for a sufficient supply of pens)

## On the survey day

- Allow at least one hour before the start of survey to complete these tasks. Work with the School Coordinator to assure that the room and materials are prepared before testing.
  - Ensure there are enough copies of survey questionnaires to distribute to every student.
  - Make sure that students are seated quietly, with nothing on the desk except for a pen or pencil.
  - Contact your School Coordinator if you have any questions or concerns.

## Assistance

- Do not answer questions about the content of the test items, or provide any specific information or answers about any of survey items.
- Be sure that all students understand what they are supposed to do and how to mark their answers. Survey administrator may answer students' questions about these matters.
- Survey administrators may answer the questions related to technical terms (e.g., wireless Internet).
- Make note of any problems encountered during the survey administration.

## Survey administration

- There is no survey administration script.
- All essential instructions are provided in the survey questionnaire. Survey administrators must read aloud these instructions to the students word for word to ensure that the survey sessions are conducted in the same way in all countries.
- Read these instructions exactly as they are written.
- Survey administrators may answer students' questions related to general procedures or technical terms, not on specific content of the test items.
- Do not allow students to open the survey questionnaire until you tell them to.

## After survey session

- Collect the questionnaires and keep them secured.
- Return survey materials to the School Coordinator.
- The School Coordinator collects survey materials for shipment and sends them back to the National Research Team (NRT).
- The School Coordinator should send school-related information to the NRT.

## School-related information

### **School Coordinators should send school-related information to the NRT as follow:**

- School size: Number of students in school and in grade surveyed
- School location: Size and type of community in which the school is located
- School SES: Percentage of students from economically disadvantaged homes
- School type: Public or private
- Proportion of girls enrolled at school
- Availability of computers
- Availability of the Internet at school
- Total number of teaching staffs at school
- School ICT-related curriculum: Whether school has ICT-related classes (e.g., basic coding skills) or not. If it has, specifies the information



## Checklist for National Research Team

Translation and Verification		√
1	Translator has excellent knowledge of English and target language, basic knowledge on contents (i.e., digital citizenship), and experience or knowledge in survey design.	<input type="checkbox"/>
2	[Forward Translation] Two researchers experienced in opinion surveys independently translate the questionnaire and compile the two translations into one.	<input type="checkbox"/>
3	[Forward Translation] Translated questionnaire maintains conceptual equivalence, while using simple and concise expressions. Also, the language of the most common audience of youth is used, considering issues of gender and age applicability and offensiveness.	<input type="checkbox"/>
4	[Expert Panel] At least one expert panel is bilingual, and s/he identifies and resolves the inadequate expressions/concepts of the translation, as well as any discrepancies between the original and forward translation.	<input type="checkbox"/>
5	[Back Translation] The modified questionnaire is sent to back-translation by a native English speaker with a sufficient level of knowledge.	<input type="checkbox"/>
6	[Cognitive Interviewing] Small group of children are sampled from the target population, and they are asked a few questions whether the questionnaire items make sense to them.	<input type="checkbox"/>
7	[Final Version] The final version includes a summary of revision history (e.g. modifications proposed by the expert panel and cognitive interviewing, demographic information of the experts and interviewees).	<input type="checkbox"/>
Sample Design		√
1	Target students are 15-year-old students who are attending educational institutions in grades 8 and higher, enrolling full-time educational institutions, and not having limited proficiency in the questionnaire language, intellectually/functionally disability.	<input type="checkbox"/>
2	Each country has a sample size of at least 1,000 surveyed students, with a minimum size of 20 schools in which 50 students are selected for the study.	<input type="checkbox"/>
3	[The first stage of stratification] Independent samples of schools are selected from each explicit stratum.	<input type="checkbox"/>
4	[The second stage of stratification] Target-grade students are selected with equal probability within participating schools.	<input type="checkbox"/>
5	School-level exclusions are made with schools that are geographically remote, have very few students, have a curriculum or structure different from the mainstream education system, and are specifically for students with special needs.	<input type="checkbox"/>
6	Within-school exclusions are made with students who are intellectually/physically disabled or non-native language speakers, and do not want to participate in survey administration.	<input type="checkbox"/>

Field Operations		√
1	National research team (NRT) identify eligible schools, select the participating schools, and contact the schools.	<input type="checkbox"/>
2	NRT Identify school coordinators who will involve in survey administration in each school, and provide standardized guideline for the overall data collection procedure.	<input type="checkbox"/>
3	School coordinator sends the list of all in-scope students to NRT.	<input type="checkbox"/>
4	NRT samples students and sends the list of these students to school coordinator.	<input type="checkbox"/>
5	NRT and school coordinator make agreement on the availability of sampled students and the survey procedure (e.g., survey date/place).	<input type="checkbox"/>
6	NRT send questionnaire and manual to school coordinator.	<input type="checkbox"/>
7	School coordinator and test administrators prepare for the survey administration.	<input type="checkbox"/>
8	School coordinator and/or survey administrator conducts the survey.	<input type="checkbox"/>
9	School coordinator collects survey materials for shipment and sends them back to NRT with a note on unusual occurrences during the survey, if any.	<input type="checkbox"/>
Data Cleaning and Documentation		√
1	All information in the database conform to the defined data structure.	<input type="checkbox"/>
2	The content of all codebooks and documentation appropriately reflects national adaptations to questionnaires.	<input type="checkbox"/>
3	All variables used for international comparisons are comparable across countries.	<input type="checkbox"/>
4	All institutions involved in this process apply quality control measures throughout in order to assure the quality and accuracy of the DKAP data.	<input type="checkbox"/>
5	Each country submits its data, codebooks, and documentation to the ISVP team.	<input type="checkbox"/>
6	Any inconsistencies or issues detected by ISVP during follow-up cleaning and analysis are resolved in collaboration with NRT. Modifications in database are documented for the purpose of communication among ISVP, NRT, and UNESCO.	<input type="checkbox"/>



## Annex 4: Results of Internal Consistency, Mean Correlation and Confirmatory Factor Analysis

### Internal Consistency Reliability

Cronbach's alpha coefficient was used as an indicator of the internal consistency of items in the measurement scale. Table 1 shows the Cronbach's alpha coefficient for each sub-competency of five competency- domains.

### Internal Consistency of Scale

Competency	Cronbach's alpha	Number of items	Bangladesh (N=1,055)	Fiji (N=1,236)	Korea (N=1,784)	Viet Nam (N=1,051)
ICT Literacy	.789	9	.825	.717	.848	.654
Information Literacy	.740	5	.733	.641	.822	.538
<b>Digital Literacy</b>	<b>.851</b>	<b>14</b>	<b>.877</b>	<b>.787</b>	<b>.898</b>	<b>.741</b>
Understanding Child Rights	.519	4	.491	.517	.582	.474
Personal data, Privacy and Reputation	.691	4	.623	.698	.827	.528
Promoting and Protecting Health and Well-Being	-.017	3	-.033	.018	.145	0.09
Digital Resilience	.532	3	.523	.616	.642	.396
<b>Digital Safety and Resilience</b>	<b>.687</b>	<b>14</b>	<b>.702</b>	<b>.690</b>	<b>.760</b>	<b>.565</b>

Competency	Cronbach's alpha	Number of items	Bangladesh (N=1,055)	Fiji (N=1,236)	Korea (N=1,784)	Viet Nam (N=1,051)
Interacting, Sharing, and Collaborating	.696	4	.703	.670	.781	.451
Civic Engagement	.761	4	.725	.677	.884	.594
Netiquette	.658	4	.625	.627	.873	.474
<b>Digital Participation and Agency</b>	<b>.791</b>	<b>12</b>	<b>.827</b>	<b>.735</b>	<b>.850</b>	<b>.681</b>
Self-awareness	.642	4	.665	.546	.764	.544
Self-regulation	.555	3	.560	.482	.659	.514
Self-motivation	.631	3	.544	.579	.753	.477
Interpersonal skills	.619	3	.562	.622	.745	.411
Empathy	.736	3	.698	.640	.823	.706
<b>Digital Emotional Intelligence</b>	<b>.868</b>	<b>16</b>	<b>.877</b>	<b>.837</b>	<b>.908</b>	<b>.797</b>
Creative Literacy	.777	5	.771	.720	.858	.638
Expression	.842	6	.808	.794	.918	.746
<b>Digital Creativity and Innovation</b>	<b>.865</b>	<b>11</b>	<b>.862</b>	<b>.837</b>	<b>.916</b>	<b>.714</b>

## Mean Correlations

The mean correlations between each sub-competency and their statistical significance in five domains are presented in Table 4.2~Table 4.6 respectively.

### Correlations between sub-competencies in 'Digital Literacy'

	ICT Literacy	Information Literacy
ICT Literacy	1	
Information Literacy	.625** <sup>12</sup>	1

<sup>12</sup> Correlation is significant at the .01 level (two-tailed test).

## Correlations between sub-competencies in 'Digital Safety and Resilience'

	Understanding Child Rights	Personal data, Privacy and Reputation	Promoting and Protecting Health and Well-Being	Digital Resilience
Understanding Child Rights	1			
Personal data, Privacy and Reputation	.461**	1		
Promoting and Protecting Health and Well-Being	-.037**	-.064**	+	
Digital Resilience	.307**	.515**	-.076**	1

## Correlations between sub-competencies in 'Digital Participation and Agency'

	Interacting, Sharing, and Collaborating	Civic Engagement	Netiquette
Interacting, Sharing, and Collaborating	1		
Civic Engagement	.495**	1	
Netiquette	.341**	.192**	1

## Correlations between sub-competencies in 'Digital Emotional Intelligence'

	Self-awareness	Self-regulation	Self-motivation	Interpersonal skills	Empathy
Self-awareness	1				
Self-regulation	.479**	1			
Self-motivation	.465**	.496**	1		
Interpersonal skills	.517**	.469**	.542**	1	
Empathy	.562**	.468**	.443**	.553**	1

## Correlations between sub-competencies in 'Digital Creativity and Innovation'

	Creative Literacy	Expression
Creative Literacy	1	
Expression	.551**	1

## Confirmatory Factor Analysis

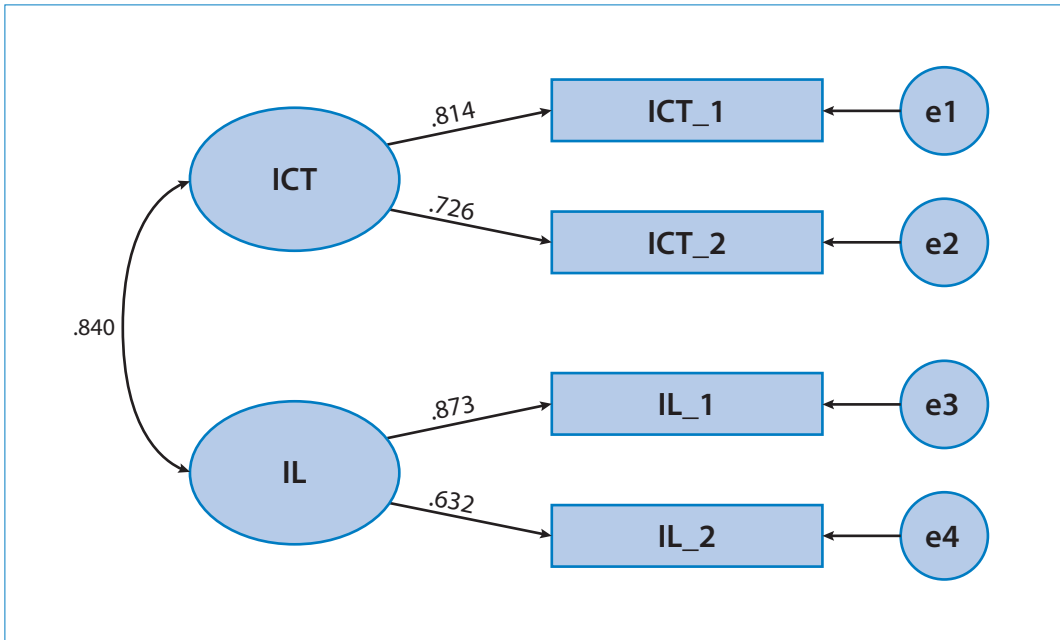
### Model Fit Summary of Digital Literacy

	chi-square (df)	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	6.407 (1)	.995	.999	.032 (.012~.058).

### Factor Loadings on 'Digital Literacy'

Sub-competency	observed variables	B	$\beta$	S.E	C.R	
ICT Literacy	ICT_1	0.916	.814	.020	45.148	***
	ICT_2	1.000	.726	-	-	
Information Literacy	IL_1	1.000	.873	-	-	
	IL_2	0.872	.632	.023	38.71	***

### Measurement Model for the Digital Literacy



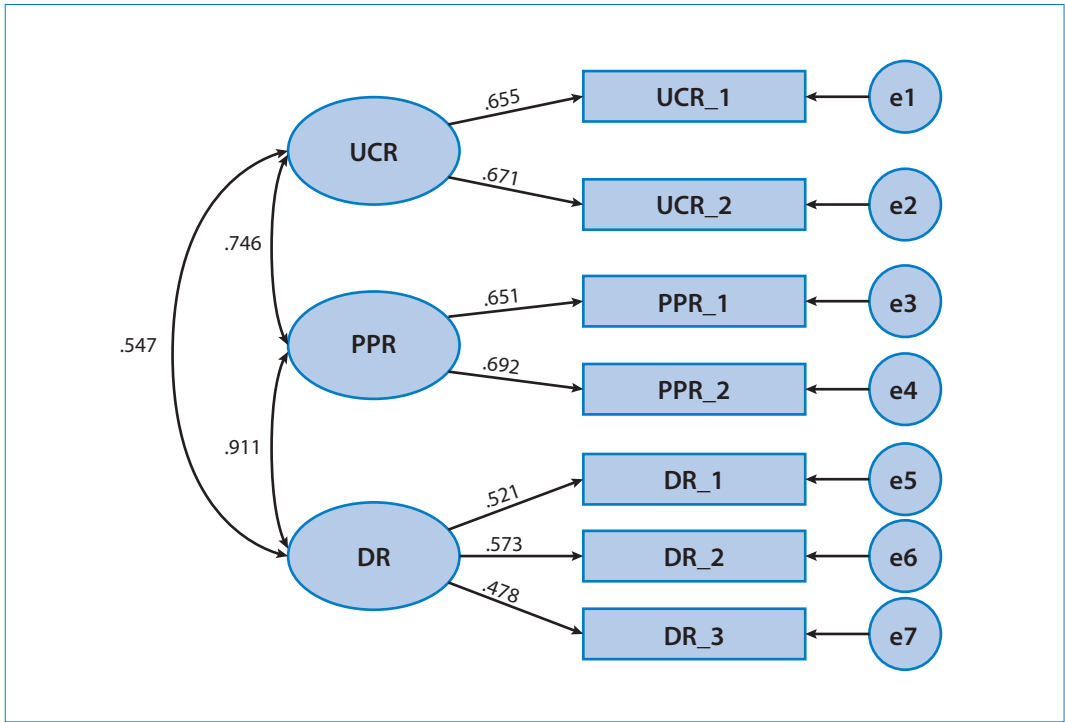
## Model Fit Summary of 'Digital Safety and Resilience'

	Chi-Square (df)	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	188.992*** (11)	.947	.972	.056 (.049~.063).

## Factor Loadings on 'Digital Safety and Resilience'

Sub-competency	observed variables	B	$\beta$	S.E	C.R
Understanding Child Rights	UCR_1(B1)	1.000	.655	-	-
	UCR_2(B2)	1.135	.671	.042	26.737***
Personal data, Privacy and Reputation	PPR_1	1.000	.651	-	-
	PPR_2	0.842	.692	.024	35.030***
Sub-competency	observed variables	B	$\beta$	S.E	C.R
Digital Resilience	DR_1(B12)	1.000	.521	-	-
	DR_2(B13)	1.042	.573	.004	24.222***
	DR_3(B14)	0.818	.478	.034	22.806***

Measurement Model for 'Digital Safety and Resilience'



Model Fit Summary of Digital Participation and Agency

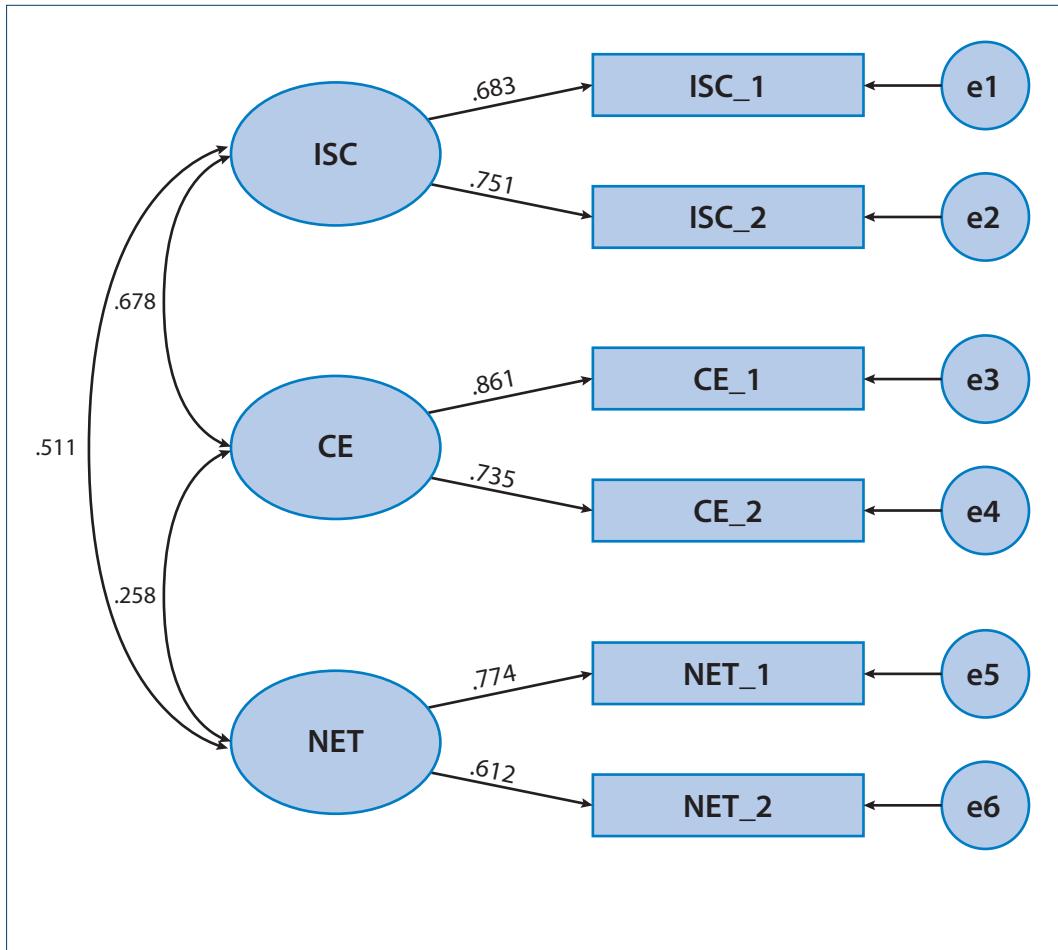
	Chi-Square (df)	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	110.188*** (6)	.966	.987	.058 (.049~.068).



## Factor Loadings on 'Digital Participation and Agency'

Sub-competency	observed variables	B	$\beta$	S.E	C.R	
Interacting, Sharing, and Collaborating	ISC_1	1.000	.683	-	-	
	ISC_2	1.049	.751	.030	34.841	***
Civic Engagement	CE_1	1.000	.861	-	-	
	CE_2	0.820	.735	.023	35.881	***
Netiquette	NET_1	1.000	.774	-	-	
	NET_2	0.774	.612	.039	19.716	***

## Measurement Model for 'Digital Participation and Agency'



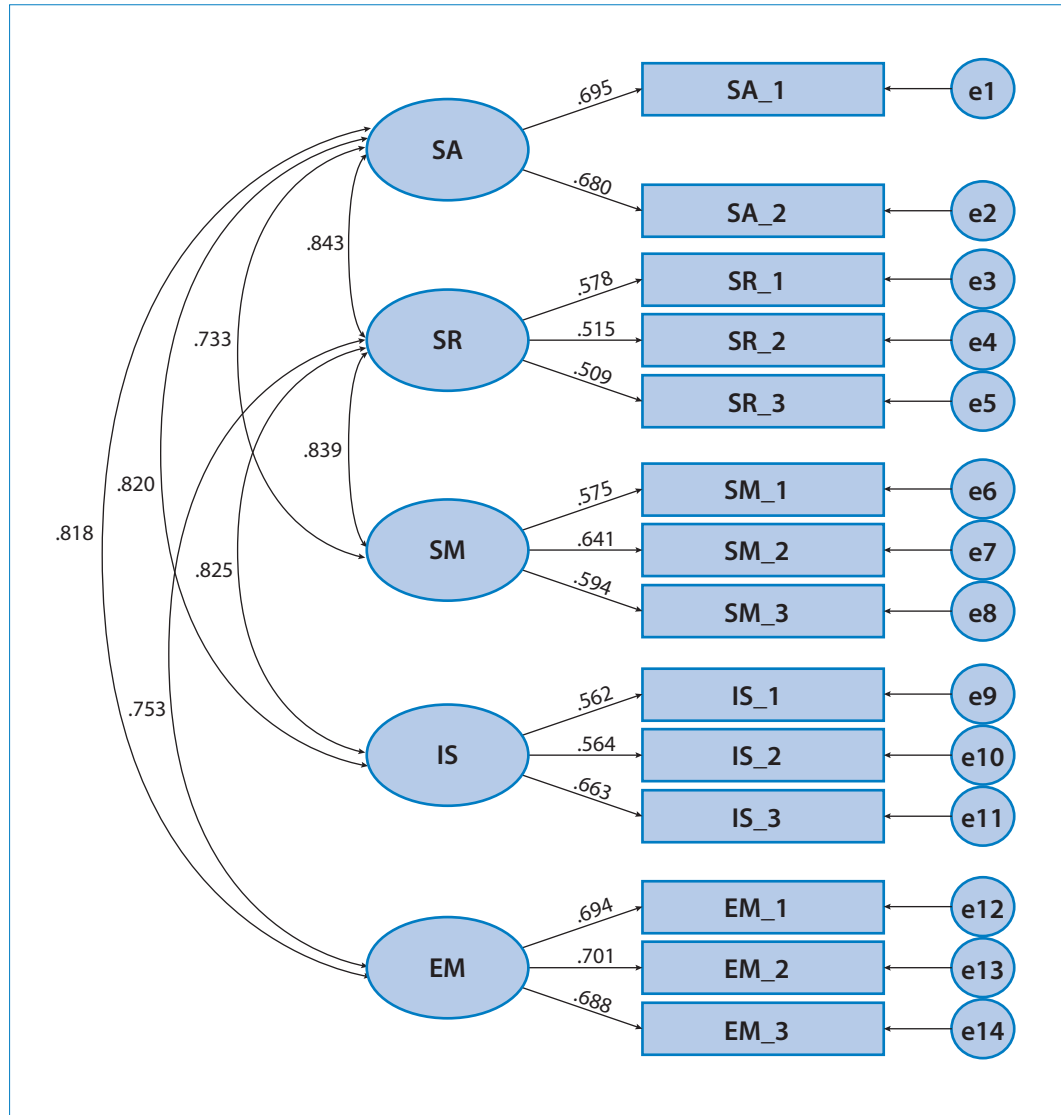
### Model Fit Summary of Digital Emotional Intelligence

	Chi-Square (df)	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	1087.952*** (67)	.928	.947	.055 (.052~.057).

### Factor Loadings on 'Digital Emotional Intelligence'

Sub-competency	observed variables	B	$\beta$	S.E	C.R	
Self-regulation	SA_1	1.000	.695	-	-	
	SA_2	1.037	.680	.027	38.863	***
Self-regulation	SR_1(D5)	1.000	.578	-	-	
	SR_2(D6)	0.988	.515	.037	26.672	***
	SR_3(D7)	0.977	.509	.038	25.992	***
Self-motivation	SM_1(D8)	1.000	.575	-	-	
	SM_2(D9)	1.083	.641	.035	31.141	***
	SM_3(D10)	1.075	.594	.036	29.821	***
Interpersonal skills	IS_1(D11)	1.000	.562	-	-	
	IS_2(D12)	0.903	.564	.030	30.086	***
	IS_3(D13)	1.048	.663	.032	33.163	***
Empathy	EM_1(D14)	1.000	.694	-	-	
	EM_2(D15)	0.967	.701	.024	40.828	***
	EM_3(D16)	1.026	.688	.025	40.474	***

## Measurement Model for 'Digital Emotional Intelligence'



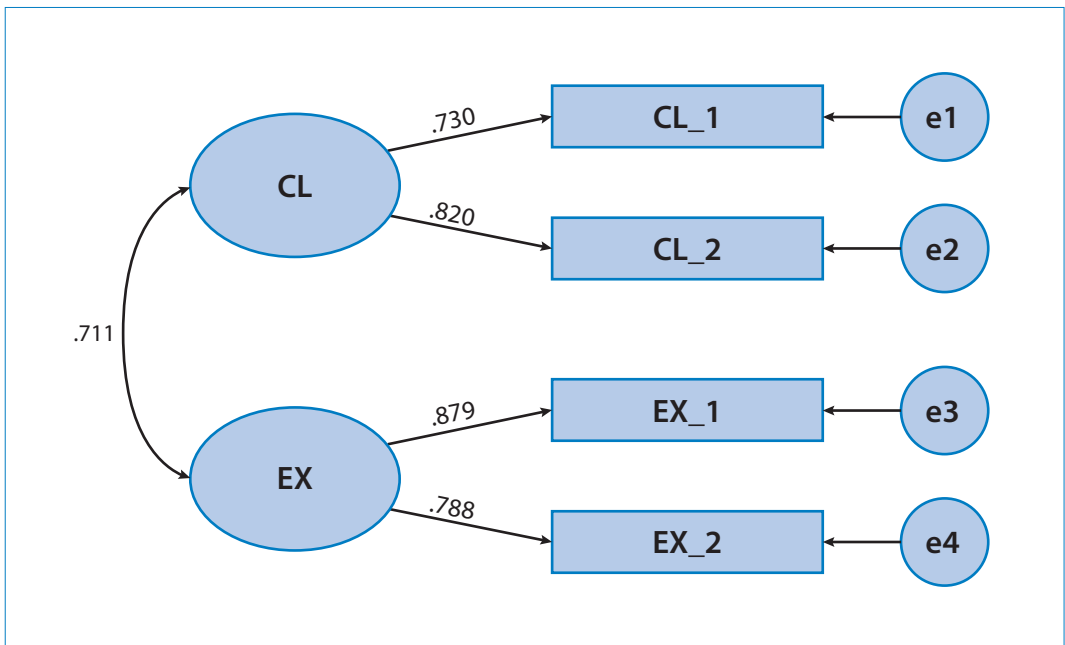
## Model Fit Summary of Digital Creativity and Innovation

	Chi-Square (df)	TLI	CFI	RMSEA (90% Confidence Interval)
Measurement Model	1.787 (1)	.999	1.000	.012 (.000~.042).

Factor Loadings on 'Digital Creativity and Innovation'

Sub-competency	observed variables	B	$\beta$	S.E	C.R
Creative Literacy	CL1	1.000	.730	-	-
	CL2	1.176	.820	.030	39.761 ***
Expression	EX1	1.000	.879	-	-
	EX2	0.911	.788	.020	46.612 ***

Measurement Model for 'Digital Creativity and Innovation'





## Annex 5: Country Mean Scores

### Bangladesh

1,055 Bangladesh students participated in survey. Girls are 49.9% among all respondents who are 9th grade. Birth year of respondents are from 2000 to 2005 and most are included in 2003(34.2%) and 2004(44.1%).

#### Descriptive Analysis on Each Domain

Domain	Mean	S.D
Digital Literacy	3.01	.61
Digital Safety and Resilience	3.33	.54
Digital Participation and Agency	3.02	.59
Digital Emotional Intelligence	3.06	.55
Digital Creativity and Innovation	2.60	.68

### Descriptive Analysis on Each Competency

		Mean	S.D
Digital Literacy	ICT Literacy	3.02	.63
	Information Literacy	2.98	.69
Digital Safety and Resilience	Understanding Child Rights	3.69	.56
	Personal Data, Privacy and Reputation	3.28	.67
	Digital Resilience	3.17	.71
Digital Participation and Agency	Interacting, Sharing and collaborating	3.18	.73
	Civic Engagement	2.56	.79
	Netiquette	3.32	.66
Digital Emotional Intelligence	Self-Awareness:	3.25	.64
	Self-Regulation	3.26	.65
	Self-Motivation	2.94	.69
	Interpersonal Skills	2.78	.72
	Empathy	2.99	.74
Digital Creativity and Innovation	Creative Literacy	2.55	.75
	Expression	2.65	.76

## Fiji

1,239 Fiji students participated in survey. Girls are 57.7% among all respondents. Birth year of respondents is either 2002 (53.5%) or 2003 (46.5%) and their school grade is mostly Grade 10 (93.1%).

### Descriptive Analysis on Each Domain

	Mean	S.D
Digital Literacy	3.14	.49
Digital Safety and Resilience	3.45	.53
Digital Participation and Agency	3.04	.50
Digital Emotional Intelligence	3.18	.50
Digital Creativity and Innovation	2.72	.66

### Descriptive Analysis on Each Competency

		Mean	S.D
Digital Literacy	ICT Literacy	3.26	.51
	Information Literacy	2.94	.64
Digital Safety and Resilience	Understanding Child Rights	3.61	.63
	Personal Data, Privacy and Reputation	3.41	.66
	Digital Resilience	3.39	.70
Digital Participation and Agency	Interacting, Sharing and collaborating	3.28	.67
	Civic Engagement	2.43	.79
	Netiquette	3.42	.62
Digital Emotional Intelligence	Self-Awareness:	3.12	.62
	Self-Regulation	3.30	.64
	Self-Motivation	3.36	.63
	Interpersonal Skills	3.11	.73
	Empathy	3.03	.74
Digital Creativity and Innovation	Creative Literacy	2.83	.71
	Expression	2.63	.77

## Korea

1,784 Korean students participated in survey. Girls are 51.5% among all respondents and most of respondents are at Grade 10 (99.7%). Birth year is mostly 2002 (94.1%).

### Descriptive Analysis on Each Domain

Domain	Mean	S.D
Digital Literacy	3.31	.51
Digital Safety and Resilience	3.53	.42
Digital Participation and Agency	2.98	.52
Digital Emotional Intelligence	3.22	.49
Digital Creativity and Innovation	2.76	.70

### Descriptive Analysis on Each Competency

		Mean	S.D
Digital Literacy	ICT Literacy	3.26	.55
	Information Literacy	3.40	.52
Digital Safety and Resilience	Understanding Child Rights	3.77	.45
	Personal Data, Privacy and Reputation	3.53	.49
	Digital Resilience	3.36	.57
Digital Participation and Agency	Interacting, Sharing and collaborating	3.06	.67
	Civic Engagement	2.37	.86
	Netiquette	3.50	.54
Digital Emotional Intelligence	Self-Awareness:	3.33	.54
	Self-Regulation	3.20	.59
	Self-Motivation	3.20	.63
	Interpersonal Skills	3.13	.64
	Empathy	3.19	.63
Digital Creativity and Innovation	Creative Literacy	2.79	.76
	Expression	2.74	.80

## Viet Nam

A total number of 1,051 Viet Nam students participated in survey. Girls are 53.1% among all respondents who are at 10th grade. Birth year of respondents are mostly 2003(99.0%).

### Descriptive Analysis on Each Domain

Domain	Mean	S.D
Digital Literacy	3.10	.32
Digital Safety and Resilience	3.35	.33
Digital Participation and Agency	3.00	.32
Digital Emotional Intelligence	2.96	.33
Digital Creativity and Innovation	2.74	.37



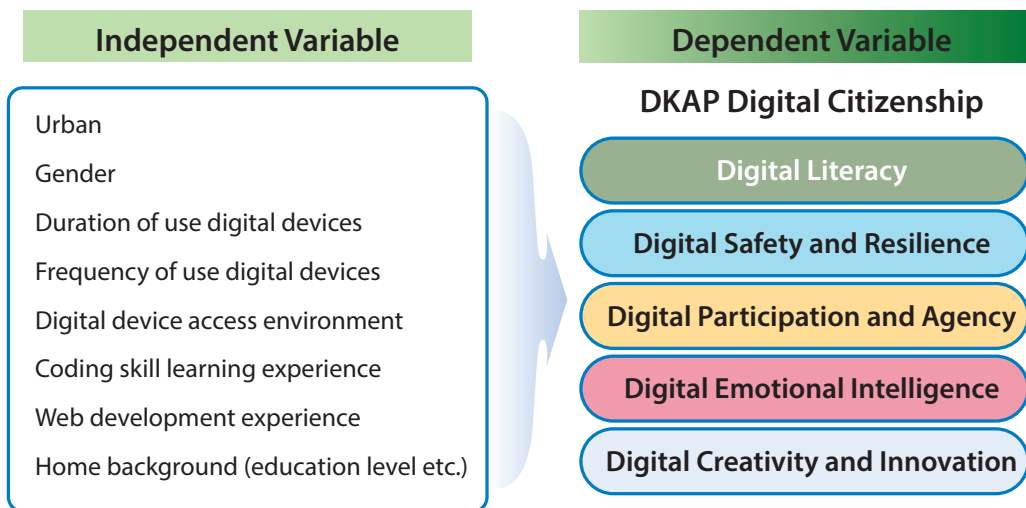
## Descriptive Analysis on Each Competency

		Mean	S.D
Digital Literacy	ICT Literacy	3.19	.33
	Information Literacy	2.93	.41
Digital Safety and Resilience	Understanding Child Rights	3.68	.44
	Personal Data, Privacy and Reputation	3.33	.43
	Digital Resilience	3.16	.49
Digital Participation and Agency	Interacting, Sharing and collaborating	3.15	.38
	Civic Engagement	2.60	.49
	Netiquette	3.26	.42
Digital Emotional Intelligence	Self-Awareness:	2.96	.45
	Self-Regulation	3.12	.46
	Self-Motivation	3.19	.42
	Interpersonal Skills	2.86	.48
	Empathy	2.66	.57
Digital Creativity and Innovation	Creative Literacy	2.68	.45
	Expression	2.80	.49

# Annex 6: Results of Multiple Regression Analysis

## DKAP Multiple Regression Analysis Model

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_3 X_{3i} + \varepsilon_i$$



## ALL COUNTRIES Digital Literacy

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.473 <sup>a</sup>	.224	.221	.43890

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.494	.039		63.208	.000		
	URBAN=1	.015	.016	.015	.957	.339	.902	1.109
	gender[F1_male=1]	-.038	.015	-.038	-2.510	.012	.978	1.023
	duration of use dd[G1]	.063	.008	.157	7.534	.000	.513	1.950
	frequency of use dd[G2]	.015	.007	.040	2.214	.027	.696	1.437
	access_devices_home[G4]	.061	.007	.170	8.707	.000	.587	1.702
	access_devices_school[G5]	.029	.007	.068	4.236	.000	.867	1.153
	learn to use computers with others[G11]	-.048	.019	-.048	-2.533	.011	.626	1.597
	learn to use the internet with others[G12]	-.035	.019	-.035	-1.873	.061	.623	1.605
	learned coding skills [G17_yes=1]	.070	.016	.067	4.357	.000	.943	1.061
	developed web or app[G18_yes=1]	.142	.019	.115	7.498	.000	.942	1.062
	parents education level[H2_H3_sum]	.019	.004	.085	4.647	.000	.671	1.490
	home environment [H4_sum]	.015	.011	.025	1.348	.178	.673	1.485
number of books[H5]	.012	.006	.036	2.044	.041	.740	1.352	

a. Dependent Variable: Digital Literacy

## ALL COUNTRIES Digital Safety and Resilience

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.284 <sup>a</sup>	.080	.077	.43584

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.020	.039		77.007	.000		
	URBAN=1	.034	.016	.037	2.180	.029	.902	1.109
	gender[F1_male=1]	-.049	.015	-.054	-3.281	.001	.978	1.023
	duration of use dd[G1]	.051	.008	.140	6.174	.000	.513	1.949
	frequency of use dd[G2]	-.022	.007	-.063	-3.215	.001	.696	1.437
	access_devices_home[G4]	.033	.007	.101	4.781	.000	.587	1.703
	access_devices_school[G5]	.013	.007	.034	1.951	.051	.867	1.153
	learn to use computers with others[G11]	-.023	.019	-.025	-1.200	.230	.626	1.596
	learn to use the internet with others[G12]	-.004	.019	-.004	-.206	.837	.623	1.605
	learned coding skills [G17_yes=1]	.021	.016	.022	1.316	.188	.943	1.060
	developed web or app[G18_yes=1]	.058	.019	.051	3.067	.002	.942	1.062
	parents education level[H2_H3_sum]	.018	.004	.088	4.424	.000	.671	1.489
	home environment [H4_sum]	.014	.011	.024	1.227	.220	.673	1.485
	number of books[H5]	-.010	.006	-.031	-1.618	.106	.740	1.352

a. Dependent Variable: Digital Safety and Resilience

## ALL COUNTRIES Digital Participation and Agency

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.246 <sup>a</sup>	.061	.057	.47499

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.728	.043		63.866	.000		
	URBAN=1	.003	.017	.003	.193	.847	.902	1.109
	gender[F1_male=1]	-.064	.016	-.065	-3.921	.000	.977	1.023
	duration of use dd[G1]	.013	.009	.032	1.402	.161	.513	1.949
	frequency of use dd[G2]	.036	.007	.096	4.864	.000	.696	1.437
	access_devices_home[G4]	.018	.008	.049	2.296	.022	.587	1.702
	access_devices_school[G5]	.029	.007	.069	3.920	.000	.868	1.153
	learn to use computers with others[G11]	.001	.021	.001	.062	.950	.627	1.596
	learn to use the internet with others[G12]	.017	.020	.017	.822	.411	.623	1.604
	learned coding skills [G17_yes=1]	.070	.017	.068	4.041	.000	.943	1.060
	developed web or app[G18_yes=1]	.143	.021	.118	6.970	.000	.942	1.062
	parents education level[H2_H3_sum]	.012	.004	.054	2.705	.007	.670	1.492
	home environment [H4_sum]	-.030	.012	-.048	-2.406	.016	.673	1.485
	number of books[H5]	-.003	.006	-.010	-.502	.615	.740	1.351

a. Dependent Variable: Digital Participation and Agency

## ALL COUNTRIES Digital Emotional Intelligence

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328 <sup>a</sup>	.108	.104	.45641

### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	2.660	.041		64.825	.000		
	URBAN=1	.006	.016	.006	.376	.707	.902	1.109
	gender[F1_male=1]	-.047	.016	-.049	-3.026	.002	.978	1.023
	duration of use dd[G1]	.032	.009	.083	3.711	.000	.513	1.949
	frequency of use dd[G2]	.002	.007	.005	.283	.777	.696	1.438
	access_devices_home[G4]	.038	.007	.109	5.204	.000	.587	1.703
	access_devices_school[G5]	.030	.007	.072	4.190	.000	.867	1.153
	learn to use computers with others[G11]	-.032	.020	-.032	-1.586	.113	.627	1.595
	learn to use the internet with others[G12]	.015	.020	.016	.769	.442	.623	1.604
	learned coding skills [G17_yes=1]	.030	.017	.030	1.800	.072	.943	1.061
	developed web or app[G18_yes=1]	.164	.020	.137	8.291	.000	.941	1.062
	parents education level[H2_H3_sum]	.020	.004	.089	4.558	.000	.672	1.489
	home environment [H4_sum]	.014	.012	.023	1.197	.231	.674	1.485
	number of books[H5]	.008	.006	.023	1.257	.209	.740	1.351

a. Dependent Variable: Digital Emotional Intelligence

## ALL COUNTRIES Digital Creativity and Innovation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.345 <sup>a</sup>	.119	.116	.59132

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.138	.053		40.218	.000		
	URBAN=1	.005	.021	.004	.213	.832	.902	1.109
	gender[F1_male=1]	-.030	.020	-.024	-1.472	.141	.978	1.023
	duration of use dd[G1]	.041	.011	.081	3.658	.000	.513	1.950
	frequency of use dd[G2]	.058	.009	.121	6.326	.000	.694	1.440
	access_devices_home[G4]	.022	.010	.047	2.262	.024	.587	1.703
	access_devices_school[G5]	.034	.009	.063	3.669	.000	.867	1.153
	learn to use computers with others[G11]	-.060	.026	-.047	-2.329	.020	.627	1.595
	learn to use the internet with others[G12]	.031	.025	.025	1.228	.220	.624	1.603
	learned coding skills [G17_yes=1]	.114	.022	.087	5.312	.000	.942	1.061
	developed web or app[G18_yes=1]	.274	.026	.176	10.700	.000	.941	1.063
	parents education level[H2_H3_sum]	.021	.006	.073	3.772	.000	.672	1.488
	home environment [H4_sum]	-.038	.015	-.048	-2.459	.014	.673	1.486
number of books[H5]	.009	.008	.020	1.101	.271	.741	1.350	

a. Dependent Variable: Digital Creativity and Innovation

## Annex 7: Tables of Gender Differences by Domain

### Access to digital devices at home

		Number of digital devices accessible at home						Chi-Square
		0	1	2	3	4	5	
Combined	Total	196	1419	1208	1050	749	487	16.768**
	%	3.8%	27.8%	23.6%	20.6%	14.7%	9.5%	
	Girl	94	716	624	570	417	288	
	%	3.5%	26.4%	23.0%	21.0%	15.4%	10.6%	
	Boy	102	703	584	480	332	199	
	%	4.3%	29.3%	24.3%	20.0%	13.8%	8.3%	
Bangladesh	Total	83	500	272	139	44	17	14.490*
	%	7.9%	47.4%	25.8%	13.2%	4.2%	1.6%	
	Girl	32	236	145	73	27	13	
	%	6.1%	44.9%	27.6%	13.9%	5.1%	2.5%	
	Boy	51	264	127	66	17	4	
	%	9.6%	49.9%	24.0%	12.5%	3.2%	.8%	
Fiji	Total	87	448	250	235	114	93	5.122
	%	7.1%	36.5%	20.4%	19.2%	9.3%	7.6%	
	Girl	52	255	155	138	63	46	
	%	7.3%	36.0%	21.9%	19.5%	8.9%	6.5%	
	Boy	35	193	95	97	51	47	
	%	6.8%	37.3%	18.3%	18.7%	9.8%	9.1%	



		Number of digital devices accessible at home						Chi-Square
		0	1	2	3	4	5	
Korea	Total	20	145	333	478	487	313	46.985***
	%	1.1%	8.2%	18.8%	26.9%	27.4%	17.6%	
	Girl	7	49	142	255	271	192	
	%	0.8%	5.3%	15.5%	27.8%	29.6%	21.0%	
	Boy	13	96	191	223	216	121	
	%	1.5%	11.2%	22.2%	25.9%	25.1%	14.1%	
Viet Nam	Total	6	326	353	198	104	64	1.083
	%	0.6%	31.0%	33.6%	18.8%	9.9%	6.1%	
	Girl	3	176	182	104	56	37	
	%	0.5%	31.5%	32.6%	18.6%	10.0%	6.6%	
	Boy	3	150	171	94	48	27	
	%	0.6%	30.4%	34.7%	19.1%	9.7%	5.5%	

\*\*\*p<.001, \*\*p<.01, \*p<.05

## Access to digital devices at school

		Number of digital devices accessible at school						Chi-Square
		0	1	2	3	4	5	
Combined	Total	652	1963	1316	754	261	167	17.471**
	%	12.8%	38.4%	25.7%	14.7%	5.1%	3.3%	
	Girl	325	990	728	429	150	91	
	%	12.0%	36.5%	26.8%	15.8%	5.5%	3.4%	
	Boy	327	973	588	325	111	76	
	%	13.6%	40.5%	24.5%	13.5%	4.6%	3.2%	
Bangladesh	Total	147	364	272	204	48	20	34.612***
	%	13.9%	34.5%	25.8%	19.3%	4.5%	1.9%	
	Girl	104	175	115	102	19	11	
	%	19.8%	33.3%	21.9%	19.4%	3.6%	2.1%	
	Boy	43	189	157	102	29	9	
	%	8.1%	35.7%	29.7%	19.3%	5.5%	1.7%	
Fiji	Total	224	365	351	176	58	59	12.333*
	%	18.2%	29.6%	28.5%	14.3%	4.7%	4.8%	
	Girl	114	208	206	115	40	31	
	%	16.0%	29.1%	28.9%	16.1%	5.6%	4.3%	
	Boy	110	157	145	61	18	28	
	%	21.2%	30.3%	27.9%	11.8%	3.5%	5.4%	
Korea	Total	131	585	487	347	144	81	49.150***
	%	7.4%	33.0%	27.4%	19.5%	8.1%	4.6%	
	Girl	35	278	273	199	86	45	
	%	3.8%	30.3%	29.8%	21.7%	9.4%	4.9%	
	Boy	96	307	214	148	58	36	
	%	11.2%	35.7%	24.9%	17.2%	6.8%	4.2%	
Viet Nam	Total	150	649	206	27	11	7	15.452**
	%	14.3%	61.8%	19.6%	2.6%	1.0%	0.7%	
	Girl	72	329	134	13	5	4	
	%	12.9%	59.1%	24.1%	2.3%	0.9%	0.7%	
	Boy	78	320	72	14	6	3	
	%	15.8%	64.9%	14.6%	2.8%	1.2%	0.6%	

\*\*\*p&lt;.001, \*\*p&lt;.01, \*p&lt;.05

## Access to the Internet at home

		Time to access the internet								Chi-Square
		Hardly ever	At least every month	At least every week	Daily or almost daily					
					Less than an hour	1-2 hours a day	3-4 hours a day	5-6 hours a day	7 hours a day or more	
Combined	Total	542	225	460	669	1311	1057	397	345	47.035***
	%	10.8%	4.5%	9.2%	13.4%	26.2%	21.1%	7.9%	6.9%	
	Girl	238	111	233	345	666	625	238	187	
	%	9.0%	4.2%	8.8%	13.1%	25.2%	23.6%	9.0%	7.1%	
	Boy	304	114	227	324	645	432	159	158	
	%	12.9%	4.8%	9.6%	13.7%	27.3%	18.3%	6.7%	6.7%	
Bangladesh	Total	207	62	96	263	275	57	16	14	75.549***
	%	20.9%	6.3%	9.7%	26.6%	27.8%	5.8%	1.6%	1.4%	
	Girl	59	25	41	128	161	44	12	11	
	%	12.3%	5.2%	8.5%	26.6%	33.5%	9.1%	2.5%	2.3%	
	Boy	148	37	55	135	114	13	4	3	
	%	29.1%	7.3%	10.8%	26.5%	22.4%	2.6%	.8%	.6%	
Fiji	Total	225	130	223	192	226	86	41	103	6.682
	%	18.4%	10.6%	18.2%	15.7%	18.4%	7.0%	3.3%	8.4%	
	Girl	140	69	129	118	130	46	22	53	
	%	19.8%	9.8%	18.2%	16.7%	18.4%	6.5%	3.1%	7.5%	
	Boy	85	61	94	74	96	40	19	50	
	%	16.4%	11.8%	18.1%	14.3%	18.5%	7.7%	3.7%	9.6%	
Korea	Total	78	23	110	131	513	550	213	132	52.139***
	%	4.5%	1.3%	6.3%	7.5%	29.3%	31.4%	12.2%	7.5%	
	Girl	25	9	49	58	229	331	128	75	
	%	2.8%	1.0%	5.4%	6.4%	25.3%	36.6%	14.2%	8.3%	
	Boy	53	14	61	73	284	219	85	57	
	%	6.3%	1.7%	7.2%	8.6%	33.6%	25.9%	10.0%	6.7%	
Viet Nam	Total	32	10	31	83	297	364	127	96	11.070
	%	3.1%	1.0%	3.0%	8.0%	28.6%	35.0%	12.2%	9.2%	
	Girl	14	8	14	41	146	204	76	48	
	%	2.5%	1.5%	2.5%	7.4%	26.5%	37.0%	13.8%	8.7%	
	Boy	18	2	17	42	151	160	51	48	
	%	3.7%	.4%	3.5%	8.6%	30.9%	32.7%	10.4%	9.8%	

\*\*\*p&lt;.001, \*\*p&lt;.01, \*p&lt;.05

## Access to the Internet at school

		Time to access the internet								Chi-Square
		Hardly ever	At least every month	At least every week	Daily or almost daily					
					Less than an hour	1-2 hours a day	3-4 hours a day	5-6 hours a day	7 hours a day or more	
Combined	Total	2831	192	389	968	361	140	60	72	9.132
	%	56.5%	3.8%	7.8%	19.3%	7.2%	2.8%	1.2%	1.4%	
	Girl	1493	89	196	528	201	80	35	34	
	%	56.2%	3.4%	7.4%	19.9%	7.6%	3.0%	1.3%	1.3%	
	Boy	1338	103	193	440	160	60	25	38	
	%	56.8%	4.4%	8.2%	18.7%	6.8%	2.5%	1.1%	1.6%	
Bangladesh	Total	728	56	79	72	43	5	13	7	6.886
	%	72.6%	5.6%	7.9%	7.2%	4.3%	.5%	1.3%	0.7%	
	Girl	369	21	37	35	16	3	7	4	
	%	75.0%	4.3%	7.5%	7.1%	3.3%	.6%	1.4%	0.8%	
	Boy	359	35	42	37	27	2	6	3	
	%	70.3%	6.8%	8.2%	7.2%	5.3%	.4%	1.2%	0.6%	
Fiji	Total	823	60	96	124	66	22	12	27	16.916*
	%	66.9%	4.9%	7.8%	10.1%	5.4%	1.8%	1.0%	2.2%	
	Girl	495	35	55	65	34	5	8	13	
	%	69.7%	4.9%	7.7%	9.2%	4.8%	0.7%	1.1%	1.8%	
	Boy	328	25	41	59	32	17	4	14	
	%	63.1%	4.8%	7.9%	11.3%	6.2%	3.3%	0.8%	2.7%	
Korea	Total	623	43	123	601	210	103	15	33	32.114***
	%	35.6%	2.5%	7.0%	34.3%	12.0%	5.9%	0.9%	1.9%	
	Girl	278	18	59	335	124	66	10	14	
	%	30.8%	2.0%	6.5%	37.1%	13.7%	7.3%	1.1%	1.5%	
	Boy	345	25	64	266	86	37	5	19	
	%	40.7%	3.0%	7.6%	31.4%	10.2%	4.4%	0.6%	2.2%	
Viet Nam	Total	657	33	91	171	42	10	20	5	3.830
	%	63.8%	3.2%	8.8%	16.6%	4.1%	1.0%	1.9%	0.5%	
	Girl	351	15	45	93	27	6	10	3	
	%	63.8%	2.7%	8.2%	16.9%	4.9%	1.1%	1.8%	0.5%	
	Boy	306	18	46	78	15	4	10	2	
	%	63.9%	3.8%	9.6%	16.3%	3.1%	0.8%	2.1%	0.4%	

\*\*\*p&lt;.001, \*\*p&lt;.01, \*p&lt;.05

## Duration of using digital devices

		Duration of using digital devices					Chi-Square
		Never	Less than 1 year	1-2 years	3-4 years	More than 5 years	
Combined	Total	241	715	810	1059	2288	43.376***
	%	4.7%	14.0%	15.8%	20.7%	44.7%	
	Girl	91	333	451	598	1243	
	%	3.4%	12.3%	16.6%	22.0%	45.8%	
	Boy	150	382	359	461	1045	
	%	6.3%	15.9%	15.0%	19.2%	43.6%	
Bangladesh	Total	108	325	323	214	84	84.933***
	%	10.2%	30.8%	30.6%	20.3%	8.0%	
	Girl	31	116	179	143	57	
	%	5.9%	22.1%	34.0%	27.2%	10.8%	
	Boy	77	209	144	71	27	
	%	14.6%	39.6%	27.3%	13.4%	5.1%	
Fiji	Total	104	291	267	273	299	3.683
	%	8.4%	23.6%	21.6%	22.1%	24.2%	
	Girl	54	177	158	160	165	
	%	7.6%	24.8%	22.1%	22.4%	23.1%	
	Boy	50	114	109	113	134	
	%	9.6%	21.9%	21.0%	21.7%	25.8%	
Korea	Total	16	39	42	241	1440	20.096***
	%	0.9%	2.2%	2.4%	13.6%	81.0%	
	Girl	3	14	16	110	775	
	%	0.3%	1.5%	1.7%	12.0%	84.4%	
	Boy	13	25	26	131	665	
	%	1.5%	2.9%	3.0%	15.2%	77.3%	
Viet Nam	Total	13	60	178	331	465	8.308
	%	1.2%	5.7%	17.0%	31.6%	44.4%	
	Girl	3	26	98	185	246	
	%	0.5%	4.7%	17.6%	33.2%	44.1%	
	Boy	10	34	80	146	219	
	%	2.0%	7.0%	16.4%	29.9%	44.8%	

\*\*\*p&lt;.001, \*\*p&lt;.01, \*p&lt;.05

## Time spent accessing the Internet using digital devices

		Frequency of using digital devices						Chi-Square
		Hardly ever	Less than an hour	1-2 hours	3-4 hours	5-6 hours	7 hours or more	
Combined	Total	550	782	1565	1386	511	317	41.608***
	%	10.8%	15.3%	30.6%	27.1%	10.0%	6.2%	
	Girl	248	392	798	793	311	171	
	%	9.1%	14.4%	29.4%	29.2%	11.5%	6.3%	
	Boy	302	390	767	593	200	146	
	%	12.6%	16.3%	32.0%	24.7%	8.3%	6.1%	
Bangladesh	Total	247	328	366	83	21	9	101.584***
	%	23.4%	31.1%	34.7%	7.9%	2.0%	.9%	
	Girl	66	154	223	56	19	8	
	%	12.5%	29.3%	42.4%	10.6%	3.6%	1.5%	
	Boy	181	174	143	27	2	1	
	%	34.3%	33.0%	27.1%	5.1%	.4%	.2%	
Fiji	Total	234	311	357	168	86	78	14.710*
	%	19.0%	25.2%	28.9%	13.6%	7.0%	6.3%	
	Girl	157	181	199	93	49	35	
	%	22.0%	25.4%	27.9%	13.0%	6.9%	4.9%	
	Boy	77	130	158	75	37	43	
	%	14.8%	25.0%	30.4%	14.4%	7.1%	8.3%	
Korea	Total	47	89	514	727	250	147	40.965***
	%	2.6%	5.0%	29.0%	41.0%	14.1%	8.3%	
	Girl	15	33	227	405	152	83	
	%	1.6%	3.6%	24.8%	44.3%	16.6%	9.1%	
	Boy	32	56	287	322	98	64	
	%	3.7%	6.5%	33.4%	37.5%	11.4%	7.5%	
Viet Nam	Total	22	54	328	408	154	83	17.074**
	%	2.1%	5.1%	31.3%	38.9%	14.7%	7.9%	
	Girl	10	24	149	239	91	45	
	%	1.8%	4.3%	26.7%	42.8%	16.3%	8.1%	
	Boy	12	30	179	169	63	38	
	%	2.4%	6.1%	36.5%	34.4%	12.8%	7.7%	

\*\*\*p&lt;.001, \*\*p&lt;.01, \*p&lt;.05

## Gender difference in Digital Literacy

		N	Mean	S.D	t
Bangladesh	Male	529	2.89	.65	-6.629***
	Female	526	3.13	.53	
Fiji	Male	521	3.18	.47	0
	Female	715	3.12	.50	2.334*
Korea	Male	865	3.27	.55	-3.024**
	Female	919	3.35	.45	
Viet Nam	Male	493	3.09	.32	-.530
	Female	558	3.10	.31	
Total	Male	2408	3.13	.54	-4.357***
	Female	2718	3.19	.47	

## Gender difference in Digital Safety and Resilience

		N	Mean	S.D	t
Bangladesh	Male	529	3.29	.59	-2.882**
	Female	526	3.38	.51	
Fiji	Male	521	3.43	.51	-.863
	Female	715	3.47	.55	
Korea	Male	863	3.49	.45	-3.519***
	Female	919	3.56	.39	
Viet Nam	Male	493	3.33	.34	-2.216*
	Female	557	3.37	.33	
Total	Male	2406	3.40	.49	-4.657***
	Female	2717	3.46	.45	

## Gender difference in Digital Participation and Agency

		N	Mean	S.D	t
Bangladesh	Male	529	2.91	.65	-6.009***
	Female	526	3.13	.51	
Fiji	Male	521	3.09	.47	2.657**
	Female	715	3.01	.52	
Korea	Male	860	2.92	.56	-3.946***
	Female	918	3.02	.47	
Viet Nam	Male	492	2.98	.34	-2.259*
	Female	558	3.02	.30	
Total	Male	2402	2.97	.53	-5.127***
	Female	2717	3.04	.47	

## Gender difference in Digital Emotional Intelligence

		N	Mean	S.D	t
Bangladesh	Male	529	2.98	.60	-4.775***
	Female	526	3.14	.49	
Fiji	Male	521	3.17	.48	-.499
	Female	715	3.18	.52	
Korea	Male	858	3.19	.51	-2.082*
	Female	919	3.24	.46	
Viet Nam	Male	492	2.97	.34	1.032
	Female	558	2.95	.33	
Total	Male	2400	3.09	.51	-3.769***
	Female	2718	3.15	.47	



## Gender difference in Digital Creativity and Innovation

		N	Mean	S.D	t
Bangladesh	Male	528	2.44	.69	-8.245***
	Female	526	2.77	.62	
Fiji	Male	521	2.80	.64	3.886***
	Female	715	2.66	.67	
Korea	Male	856	2.74	.73	-.961
	Female	919	2.77	.67	
Viet Nam	Male	492	2.75	.39	.283
	Female	558	2.74	.35	
Total	Male	2397	2.69	.66	-2.621**
	Female	2718	2.74	.61	

## Annex 8: Tables of Urban-Rural School Location Differences by Domain

### Regional difference in Digital Literacy

		N	Mean	S.D	t
Bangladesh	Rural	842	3.00	0.61	-1.263
	Urban	213	3.05	0.60	
Fiji	Rural	505	3.08	0.50	-4.111***
	Urban	731	3.19	0.48	
Korea	Rural	882	3.27	0.49	-3.097**
	Urban	902	3.35	0.51	
Viet Nam	Rural	540	3.07	0.32	-3.069**
	Urban	511	3.13	0.32	
Total	Rural	2769	3.11	0.52	-7.998***
	Urban	2357	3.23	0.49	

## Regional difference in Digital Safety and Resilience

		N	Mean	S.D	t
Bangladesh	Rural	842	3.30	0.54	-3.966***
	Urban	213	3.46	0.49	
Fiji	Rural	505	3.37	0.54	-3.920***
	Urban	731	3.49	0.52	
Korea	Rural	882	3.50	0.42	-2.366*
	Urban	900	3.55	0.42	
Viet Nam	Rural	540	3.33	0.35	-2.169*
	Urban	510	3.37	0.32	
Total	Rural	2769	3.38	0.48	-7.867***
	Urban	2354	3.48	0.45	

## Regional difference in Digital Participation and Agency

		N	Mean	S.D	t
Bangladesh	Rural	842	3.02	0.58	-.217
	Urban	213	3.03	0.64	
Fiji	Rural	505	3.04	0.51	.085
	Urban	731	3.04	0.50	
Korea	Rural	879	2.93	0.48	-3.794***
	Urban	899	3.02	0.55	
Viet Nam	Rural	539	3.01	0.31	.464
	Urban	511	3.00	0.33	
Total	Rural	2765	2.99	0.50	-2.217*
	Urban	2354	3.02	0.50	

## Regional difference in Digital Emotional Intelligence

		N	Mean	S.D	t
Bangladesh	Rural	842	3.05	0.55	-.854
	Urban	213	3.09	0.57	
Fiji	Rural	505	3.12	0.53	-3.172**
	Urban	731	3.22	0.48	
Korea	Rural	880	3.18	0.47	-2.919**
	Urban	897	3.25	0.50	
Viet Nam	Rural	540	2.95	0.31	-.894
	Urban	510	2.97	0.35	
Total	Rural	2767	3.09	0.49	-5.671***
	Urban	2351	3.16	0.49	

## Regional difference in Digital Creativity and Innovation

		N	Mean	S.D	t
Bangladesh	Rural	841	2.61	0.67	.413
	Urban	213	2.59	0.70	
Fiji	Rural	505	2.83	0.63	5.038***
	Urban	731	2.64	0.67	
Korea	Rural	878	2.68	0.70	-4.947***
	Urban	897	2.84	0.70	
Viet Nam	Rural	540	2.71	0.35	-3.100**
	Urban	510	2.78	0.38	
Total	Rural	2764	2.69	0.63	-2.916**
	Urban	2351	2.74	0.64	

## Annex 9: Challenges Identified by Pilot Countries

	Bangladesh	Fiji	Korea	Viet Nam
Pilot Testing	<ul style="list-style-type: none"> <li>• A concern relating to the Bangla-version questionnaire occurred but through a series of workshops with experts who were helpful to contextualize the questionnaire, finally no problem was found in Pilot testing.</li> <li>• There was still a concern on sampling: there were worries whether samples would be enough for the whole country.</li> <li>• There was concern related to the role of test administrators. The Bangladesh research team limited the role to only giving students an overview of the study and clarifications if needed.</li> </ul>	<ul style="list-style-type: none"> <li>• In order to reduce potential problems, Fiji conducted pre-pilot test with 20 students. From the pre-pilot result, research team obtained relevant information on students' responses and experiences on the survey.</li> <li>• There was no big concern on the Fiji-version questionnaire; the only issue brought by the students was the use of the abbreviation SNS in B10 that was edited in the final questionnaire.</li> </ul>	<ul style="list-style-type: none"> <li>• Korea conducted a pre-pilot test using 214 students.</li> <li>• There was no big concern related to sampling or understanding of questionnaire items.</li> </ul>	<ul style="list-style-type: none"> <li>• There was a concern on whether the survey purpose is acceptable and questions are understandable to schools and kids: some schools didn't understand the meaning of the survey</li> <li>• Through consultancy workshop, Viet Nam research team got valuable comments and consultancy from ICT experts, educators, teachers of educational institutions. Also, Viet Nam research team responded directly to schools when needed.</li> </ul>

	Bangladesh	Fiji	Korea	Viet Nam
Translation	<ul style="list-style-type: none"> <li>• Translation-related issues were the major challenge for Bangladesh team.</li> <li>• A pool of experts from different areas participated in the workshop to finalize the questionnaire.</li> </ul>	<ul style="list-style-type: none"> <li>• No special issue occurred because original English version tool was used.</li> </ul>	<ul style="list-style-type: none"> <li>• No special issue occurred because members of ISVP translated items into Korean</li> </ul>	<ul style="list-style-type: none"> <li>• Viet Nam research team had concerns about translation issues.</li> <li>• ISVP, UNESCO, and Viet Nam team had an online meeting regarding the process of translation</li> </ul>
Training	<ul style="list-style-type: none"> <li>• Training was given in a workshop combining enumerators and ICT teachers.</li> </ul>	<ul style="list-style-type: none"> <li>• Fiji research team was well-briefed on the training manual and the researchers personally went to each school to collect data.</li> </ul>	<ul style="list-style-type: none"> <li>• Korean team was well-briefed on the training manual and distributed it to each school with questionnaire.</li> </ul>	N/A
Parental consent	<ul style="list-style-type: none"> <li>• Head teachers in the orientation workshop were trained and given the parental consent form to orient parents regarding the need for the study and children's role in it.</li> </ul>	<ul style="list-style-type: none"> <li>• Schools collected parental consent using a form initially developed by the research team.</li> <li>• There were a few parents who did not give consent, hence those students were replaced by others.</li> </ul>	<ul style="list-style-type: none"> <li>• No parental consent needed</li> </ul>	N/A

	Bangladesh	Fiji	Korea	Viet Nam
School support	<ul style="list-style-type: none"> <li>The head teachers were very supportive. Through an orientation workshop, they were provided with the opportunity to understand responsibilities and to interact with each other about the arrangements.</li> </ul>	<ul style="list-style-type: none"> <li>The school heads were very supportive in making arrangements for the survey and providing us with one of their staff as survey coordinator for each school</li> </ul>	<ul style="list-style-type: none"> <li>The school heads were very supportive. ISVP contacted each participating school to explain the purpose of survey</li> </ul>	<ul style="list-style-type: none"> <li>The schools took responsibility for supporting the survey, and for providing full information about the condition of the school's facilities, and response of teaching staff and students.</li> </ul>
Co-ordination	<ul style="list-style-type: none"> <li>Involvement of Director (Secondary) as DKAP Bangladesh Convenor and of DSHE Educational Management Information System (EMIS) officials and Field officers helped survey implementation</li> </ul>	<ul style="list-style-type: none"> <li>The research was headed by the Research Unit of the ministry. This made the research process much easier.</li> </ul>	<ul style="list-style-type: none"> <li>The Ministry of Education (MOE), school leaders, and research team were well-coordinated. Because MOE involved in survey implementation, collaboration was much easier.</li> </ul>	<ul style="list-style-type: none"> <li>Different stakeholders including Ministry of Education and Training (MOET), Vietnam Institute of Educational Sciences, Provincial Department of Education and Training (POET), school leaders, UNESCO Bangkok, and UNESCO Hanoi strongly were involved.</li> </ul>



## Annex 10: SDG 4 Targets

### **Target 4.1**

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

### **Target 4.2**

By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

### **Target 4.3**

By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university

### **Target 4.4**

By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

### **Target 4.5**

By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

### **Target 4.6**

By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy

### **Target 4.7**

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and



non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

**Target 4.a**

Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

**Target 4.b**

By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries

**Target 4.c**

By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States



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